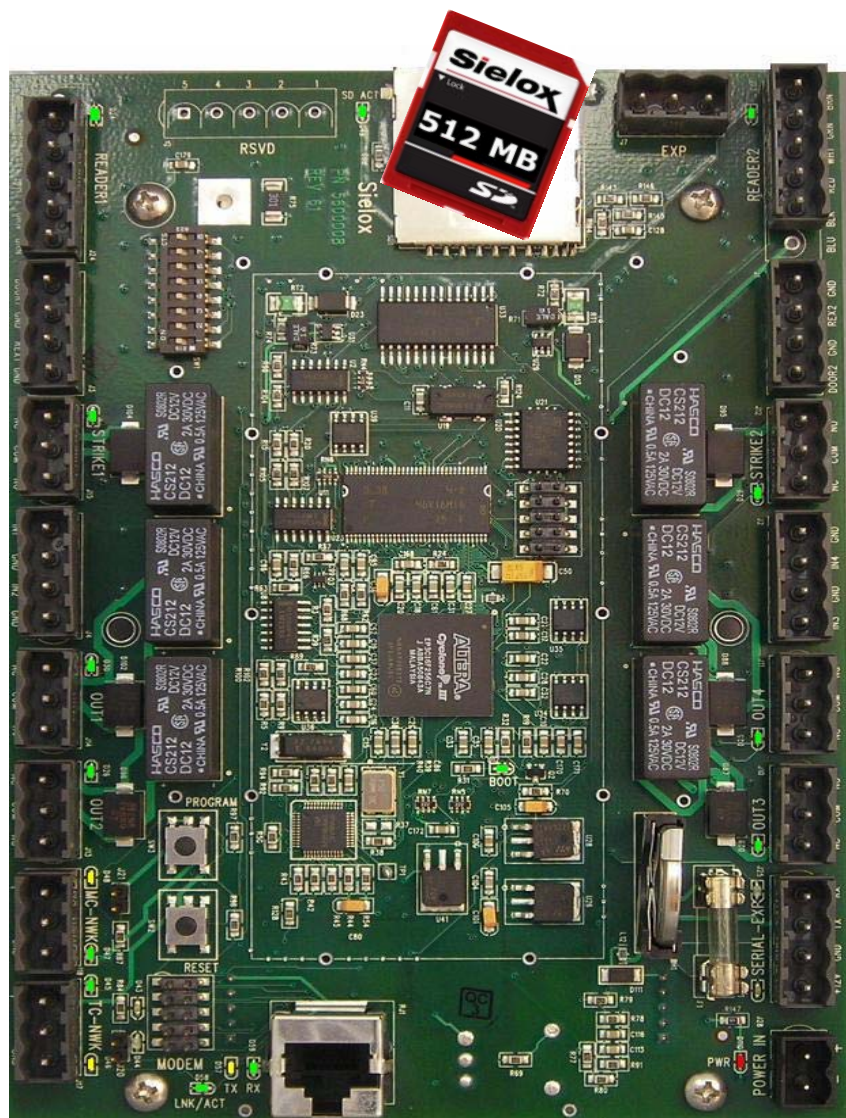




Providing Access Control Solutions since 1979

open | modular | scalable | intuitive

AC-1700 Controllers Series Installation Manual



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Introduction

The AC-1700, the next generation access control panel from Sielox, is the most advanced controller in the industry. A two door controller with capacity for 50,000 cards, 10,000 events storage, 4 general purpose I/Os and expansion up to 56 I/Os.

A true IP solution supporting POE (Power Over Ethernet) and data transfer rates up to 100 Mega bits per second, the AC-1700 can be deployed as a main or terminal controller.

Implemented as a main controller, the AC-1700 can control up to 16 terminal controllers, including one on-board, providing regional anti pass-back functionality and regional input/output linking. The AC-1700 supports the AC-1500 and the AC-1200 Terminal Controllers connected under the AC-1700 Main Controller. It does not support the AC-300 or the AC-600 Terminal Controllers.

Featuring a removable secure digital card (SD), the AC-1700 has storage capacity ranging from 128 MBytes to 1 GBytes for controller database and events storage. Equipped with a web-based maintenance port, technicians can perform infield diagnostics and updates on the AC-1700 using a Web browser, access the installation manual, save wiring diagrams, photos and more on the SD cards.

Consistent with previous Sielox product introductions, the 1700 Series offers unparalleled modularity and scalability for a total access control solution to effectively manage the security of a facility.

Controller Features

AC-1700 Main Controller

- Regional Anti pass Back.
- Regional IO Linking.
- Controls up to 16 Terminal Controllers including one on board.
- Onboard Terminal Controller.
- Card Holder Capacity – 50K with one Access Level or 25K with 3 Access Levels.
- Events storage – 10K.
- Real Time Clock – keeps the Terminal Controller time and date.
- Removable Secure Digital Card (SD) - This memory stores the event history and controller Database.
- 2 Door Controller - Add up to 4 Terminal Controllers to the Enclosure to make 8 doors per enclosure.
- 4 Supervised Inputs, 4 states and 4 Outputs programmable for latch, momentary or reflect.
- Reader Types – FIPs 201, Standard 26 bit Wiegand, Sielox format, HID Corporate 1000, ANSI Wiegand.
- I/O Expansion Board Option – Expand with an additional combination of 56 Inputs / Outputs. **(Coming Soon!)**
- Communication – On Board Ethernet and RS-485 interfaces.
- Supports AC-1500 or AC-1200 Terminal Controllers. Does not support the AC-600 or AC-300 Terminal Controllers.
- Optional POE module. **(Coming Soon!)**
- Auto-Configuration – Automatically detect and configure Main and Terminal Controllers within the Pinnacle software application
- Programmable Flash ROM – Upgrade firmware without chip replacement – Local or Remote.
- WEB Based Maintenance Port – Perform infield diagnostics and updates using the Web browser.
- Certifications – FCC and ETL Certified to UL294 and UL 1076.

AC-1700 Terminal Controller

- Card Holder Capacity – 50K with one Access Level or 25K with 3 Access Levels
- Events storage – 10K.
- Real Time Clock – keeps the Terminal Controller time and date.
- Removable Secure Digital Card (SD) - This memory stores the event history and controller databases.
- 2 Door Controller - Add up to 4 Terminal Controllers to the Enclosure to make 8 door controllers.
- 4 Supervised Inputs 4 state and 4 Outputs programmable for latch, momentary or reflect.
- Reader Types – FIPs 201, Standard 26 bit Wiegand, Sielox format, HID Corporate 1000, ANSI Wiegand.
- *I/O Expansion Board Option – Expand with an additional combination of 56 Inputs / Outputs. **(Coming Soon!)**
- Communication – On Board Ethernet and RS-485 interfaces

- Optional POE module. **(Coming Soon!)**
- Programmable Flash ROM – Upgrade firmware without chip replacement.
- WEB Based Maintenance Port – Perform infield diagnostics and updates using the Web browser.
- Certifications – FCC and ETL Certified to UL294 and UL 1076.

Safety Precautions & Compliance

This section describes specific requirements in addition to the installation requirements that are contained in this document to be followed when installing the AC-1700 products.

No Receptacle Switch Labeling

Clause 83.1(k) in UL 1076 and clause 60.1(j) in UL 294 require that this product be **labeled** with the following wording:

Do Not Connect To A Receptacle Controlled By A Switch.

UL Listed Power Supply

The AC-1700 must be powered with a UL listed power supply with a visible AC indicator. All interconnecting devices are to be powered by UL listed power limited power supplies.

Electrical Connections

The AC-1700L and AC-1700S must be installed within the protected premise in accordance with the National Electric Code (NFPA70), local codes and the authorities having jurisdiction.

Power Limited Connections

Those connections not designated as “Power Limited” must be wired according to Class 1 wiring methods with ¼” wire separation.

Primary Voltage Restrictions

Voltages greater than 30V AC or greater than 42.4V DC shall not enter the UL-approved enclosures listed in this document.

Grounding

All enclosures shall be grounded using local and national code requirements. The AC-1700 shall be grounded using the detailed descriptions in the respective sections of the manual. See [grounding](#) on page 8

AC-1700 Power Outlet Requirement

The AC-1700 power supply must NOT be plugged into a switched power outlet. The power outlet that the AC-1700 power supply plugs into must be hard wired to always be powered on.

AC-1700 Grounding Procedure

The AC-1700 enclosure (p/n 6800110) is grounded by connecting the drain wire of the power cable (that connects the DC power supply of the AC-1700) to the enclosure at the entrance of the cable to the enclosure. Then you connect the other side of the drain wire to the AC ground terminal inside the power supply.

Selecting Cable

There are several considerations regarding wiring: recommended cabling, cable installation, supervised distributed network wiring, and electro-magnetic interference (EMI).

Shielded Belden or West Penn cables (or equivalents) are recommended for reader and distributed network cabling.

Sielox recommends that all AC-1700 wiring be installed in conduit. Install conduit in accordance with national and local codes. If conduit is not practical and not required under UL standards, ensure that wiring is concealed. Take extra care not to damage the cable insulation or shielding.

Shielding

All cables that are to be used with the AC-1700 shall be shielded. The shields of these cables shall be terminated to an earth ground on one side of the cable only. Failure to properly terminate the shielding can result in faulty operation of the equipment. Sielox, LLC. shall not be liable for improper operation of the AC-1700 due to improper shielding and or unrecognized cable types.

Static Protection

The AC-1700 is susceptible to static electricity. Always ground yourself to the AC-1700 Enclosure using an ANSI/ESD S1.1-1998 compliant grounding strap. All modules and backplanes shall be left in their respective anti-static bags until their installation.

Certifications

FCC

This equipment complies with Part 15 of the FCC rules; operation is subject to the following two conditions:

This device may not cause harmful interference, and must accept any interference received, including interference that may cause undesired operation.

Operation of this equipment in a residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference.

WARNING: Changes or modifications to Sielox EAC (Electronic Access Control) equipment not expressly approved by the party responsible for assuring compliance could void the user's authority to operate the equipment in a safe or otherwise regulatory compliant manner. If equipment is not installed and used in accordance with the instructions in the AC-1700 Installation Manual, it may cause interference, in which case, the user at their own expense must take whatever measures are required to correct interference.

"This Class A digital apparatus complies with Canadian ICES-003."

«Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.»

ETL certified for UL 294

Only equipment documented in this manual may be used for proper UL compliance.

ETL certified for UL 1076

This document indicates those installation sections which must be followed in addition to all other installation instructions in this manual in order for the AC-1700 terminal controller to be UL 1076 compliant.

Technical Support & RMA's

Phone: 800-424-2126, prompt 8

FAX: 856-939-9306

8:30 am – 7:30 pm Eastern time, Monday - Friday

E-Mail: tech.support@sielox.com

Operation & Maintenance Procedures

See the Pinnacle 7 User Manual.

Periodic maintenance with a frequency of no more than one year must be done to insure proper operation of the AC-1700 terminal controllers.

Replacement Parts

1. The AC-1700 PCB Sielox part number 6201700 uses a 3V replaceable coin cell battery type **BR2032** available from Panasonic and many others.
2. The Sielox AC-1700 part number 6801705 uses one 1A, 250V size 5x20MM fuse, Littlefuse part# **0217001.HXP**

Installing Sielox Enclosures



Sielox provides 2 types of enclosures:

- Large Enclosure (p/n 6800110) up to 8 doors (Four AC-1700)
 - o Dimensions: 16" x 20" x 3.5" (40.64 cm x 50.80 cm x 8.89 cm)
- Small Enclosure (p/n 6800111) 2 doors (One AC-1700)
 - o Dimensions: 12" x 12" x 3.5" (30.48 cm x 30.48 cm x 8.89 cm)

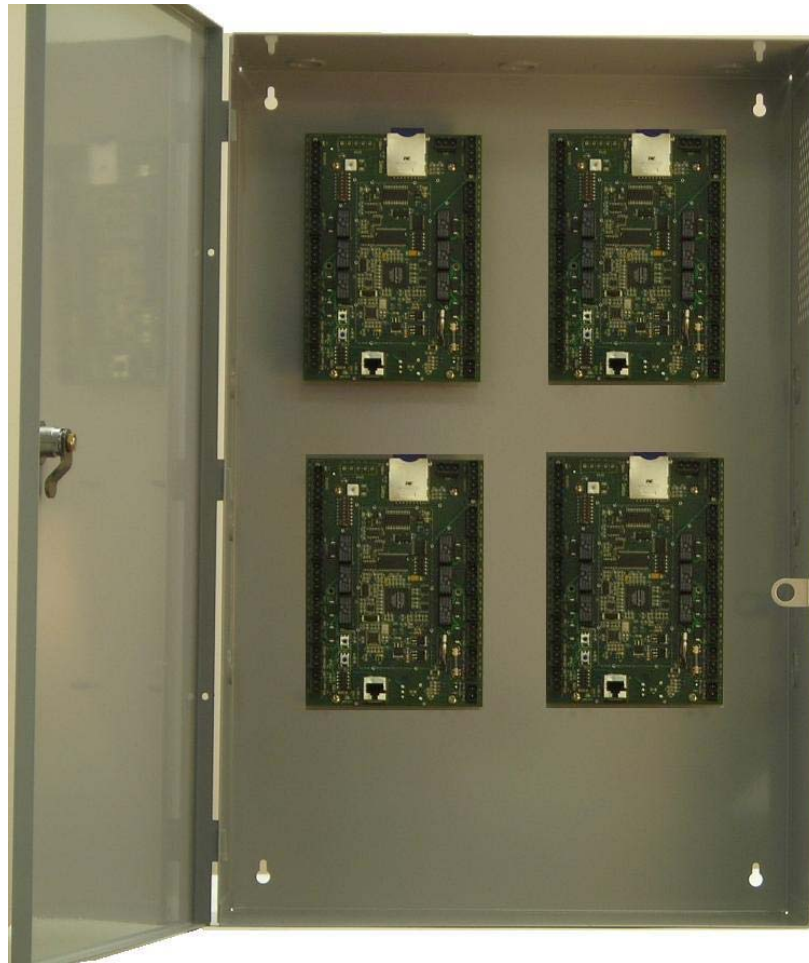
To install the Sielox enclosures, perform the following procedure:

1. Position the enclosure or template at the desired installation location and mark the four keyhole slot locations for mounting.
2. Install the applicable mounting fasteners such as wood screws, molly bolts, or masonry fasteners, but do not tighten them completely.
3. Position the enclosure on the four fasteners and tighten them completely.
4. Install the conduit, if not already completed.

5. Install a grounding lug to the Enclosure; ensure that the lug is terminated to an earth ground.
6. Clean any debris from the enclosure.

Large Enclosure (p/n 6800110)

Dimensions: 16" x 20" x 3.5" (40.64 cm x 50.80 cm x 8.89 cm)



Small Enclosure (p/n 6800111)

Dimensions: 12" x 12" x 3.5" (30.48 cm x 30.48 cm x 8.89 cm)



AC-1700 Mounting Plates

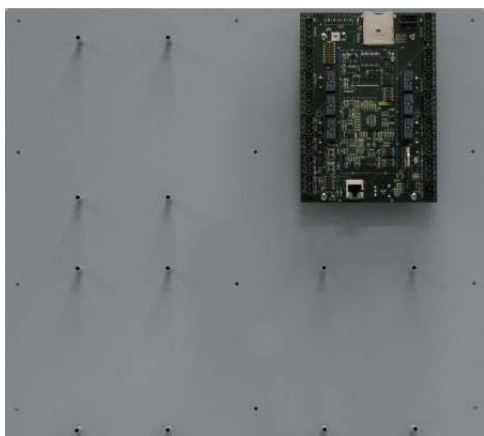
Sielox offers 3 mounting plates. AC-1700-MP, AC-1700-RMP and AC-1700-IOMP.

These mounting plates are an alternative if you are installing the AC-1700 in a different type of enclosures.



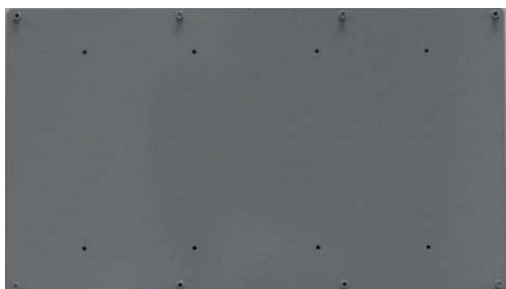
AC-1700-MP – 6800125

Mounting plate for a single AC-1700 controller board.



AC-1700-RMP – 6900127

Retrofit mounting plate for mounting up to 4 AC-1700 controller boards in the AC-1500 large enclosure or other large enclosures.



AC-1700-IOMP

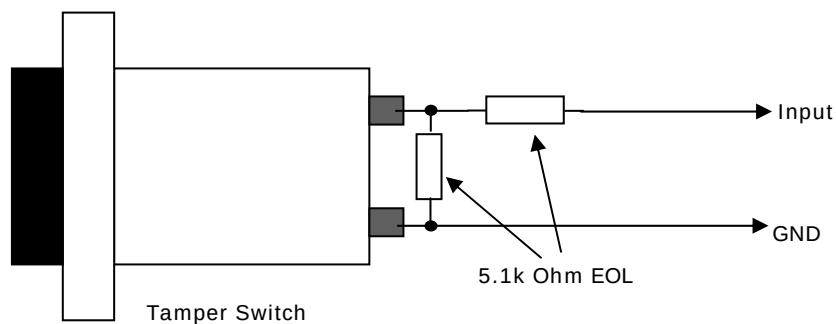
I/O mounting plate for installation of the AC-1500 I/O backplane in the AC-1700 large enclosure.



Installing a Tamper Switch

A Tamper Switch mounting channel is available in the lower right hand corner of the large enclosure (p/n 6800110) or in the lower right hand corner of the small enclosure (p/n 6800111). The switch provided by Sielox is to be installed in this mounting channel. The Tamper Switch must be connected to an Input of an installed controller. This input shall be configured as normally closed with supervision. Two supervisory resistors (5.1KOhm) shall be inserted in the wiring from the switch to the terminal controller, one across the contact of the switch, the other in the signal data line to the controller. When configured and connected in this way, the controller will properly report an "Input Active" event when the enclosure door is open and "Input Secure" when the door is closed. An "Input Cut" or "Input Shorted" status will be reported if the switch or supervision resistors are not properly assembled and connected.

Please refer to the following drawing for wiring of the Tamper Switch:



Installing Cables into the Sielox Enclosure

Signal Cables

Connect signal cables to any reader, door strike, output, input, request-to-exit and door switch. Follow these procedures:

1. Pull signal cables through the Sielox Enclosure. (See table below)
2. When connecting these cables to the AC-1700 reader, input or output modules, form a cable bundle using plastic cable ties (Tie wraps).
3. Arrange conductors so that they split out at right angles from the bundle. Allow enough slack so that the enclosure door can shut easily without pinching the cable bundle.
4. Strip $\frac{1}{4}$ inch of insulation from each conductor that inserts into a connector block.
5. Insert the stripped conductors into respective removable connectors and tighten set screws. (See [AC-1700 Connectors](#) on page 24)
6. Verify cable connections.
7. Insert removable connectors on the appropriate fixed connector.

Cable Type	AWG	Wires	Where Used	Color Code	Max. Dist.
Belden 8761 (Shielded)	22	2	Inputs (Door, REX)	Clear / Black	500 ft.
Belden 9460 (Shielded)	18	2	Outputs (Door Lock)	Clear / Black	*
West Penn 3280 (Shielded)	18	5	Wiegand Readers	Red/Black/White/Green/Brown	500 ft.
Belden 8723 (Shielded)	22	4	Communication RS-485	Red/Black/White/Green	4000 ft.
Belden 1307A	16	2	Power / Battery	Red/Black	50 ft.

*Application dependent but typically runs 500 ft.

AC-1700 Cables

Communications

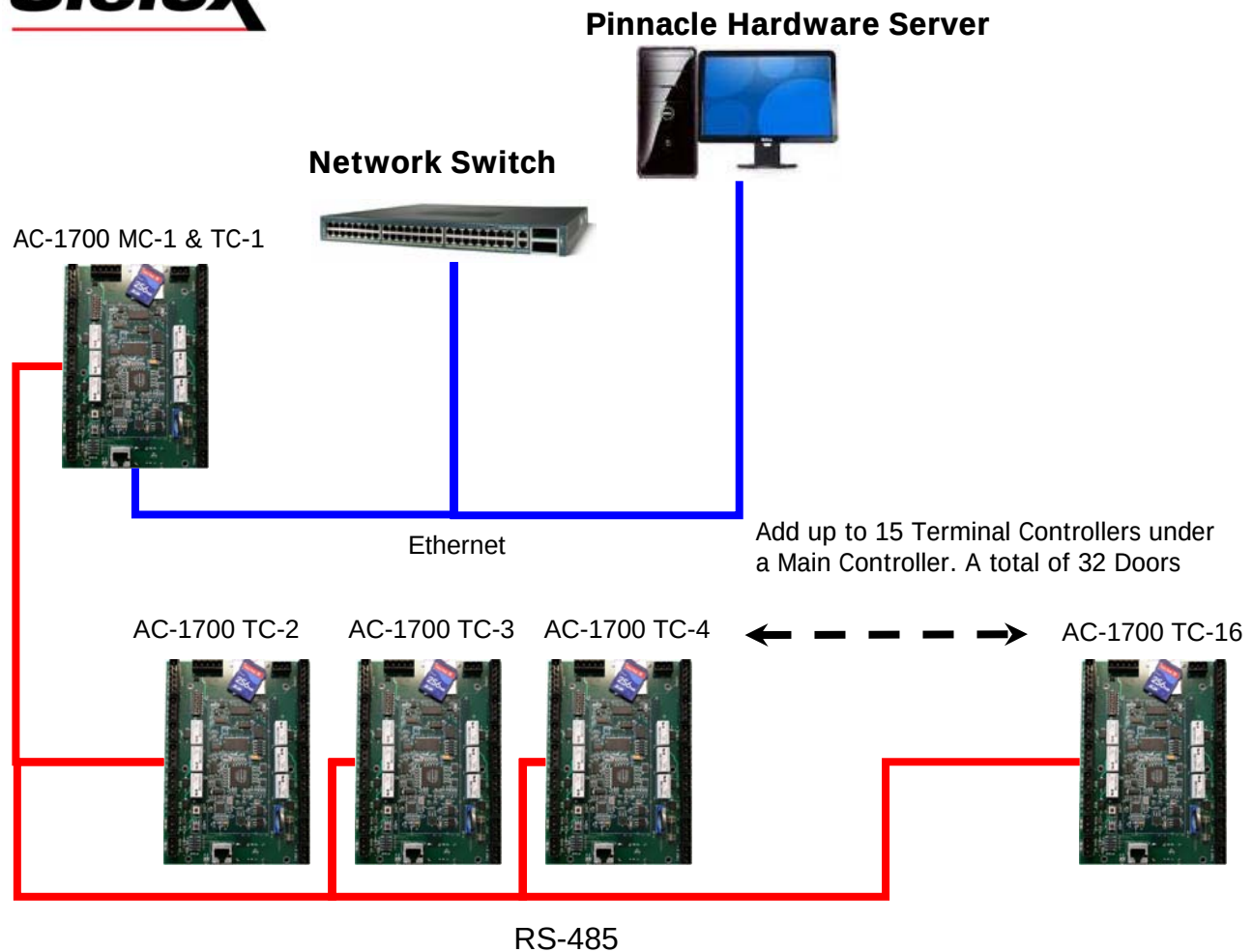
The AC-1700 controller, when configured as a Main Controller (MC), communicates directly to a Pinnacle Hardware Server via Ethernet.

The AC-1700 when configured as a Terminal Controller (TC), communicates to an AC-1700 Main Controller via RS-485.

To configure the AC-1700 to be a Main Controller or Terminal Controller [see DIP switch settings](#) on page 29.

Ethernet / RS-485

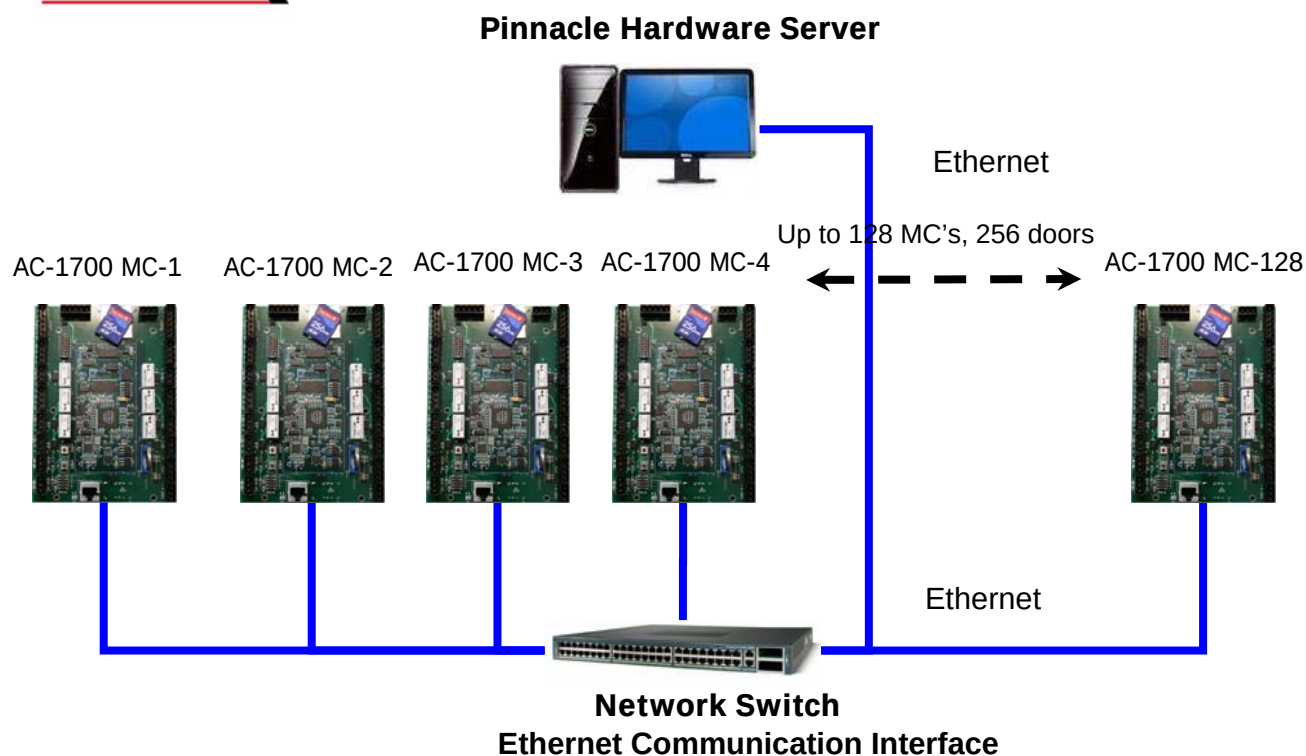
The Main Controller (MC) is connected to the Pinnacle Hardware Server through the Ethernet. It also has an on board Terminal Controller, TC-1. The MC supports up to 15 additional TC's which are connected via RS-485 and require unique addresses – [See DIP switch settings](#) on page 29.



Ethernet / RS-485 Communication Interface

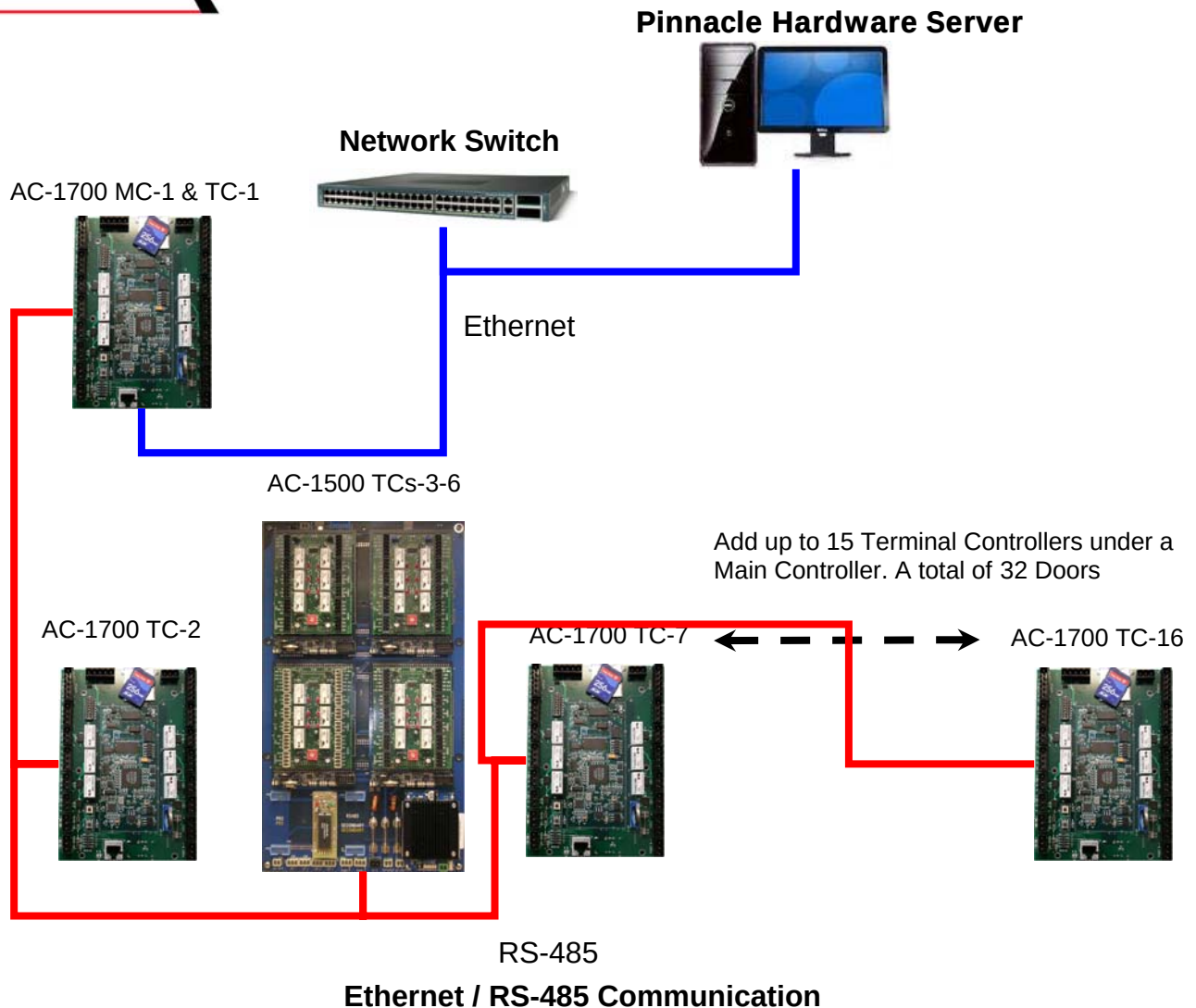
Ethernet

Main Controllers are connected to the Pinnacle Hardware Server via an Ethernet connection. They all have an on board Terminal Controller, TC-1. With this setup you can access each individual MC web maintenance port. [See Web Maintenance](#) on page 36

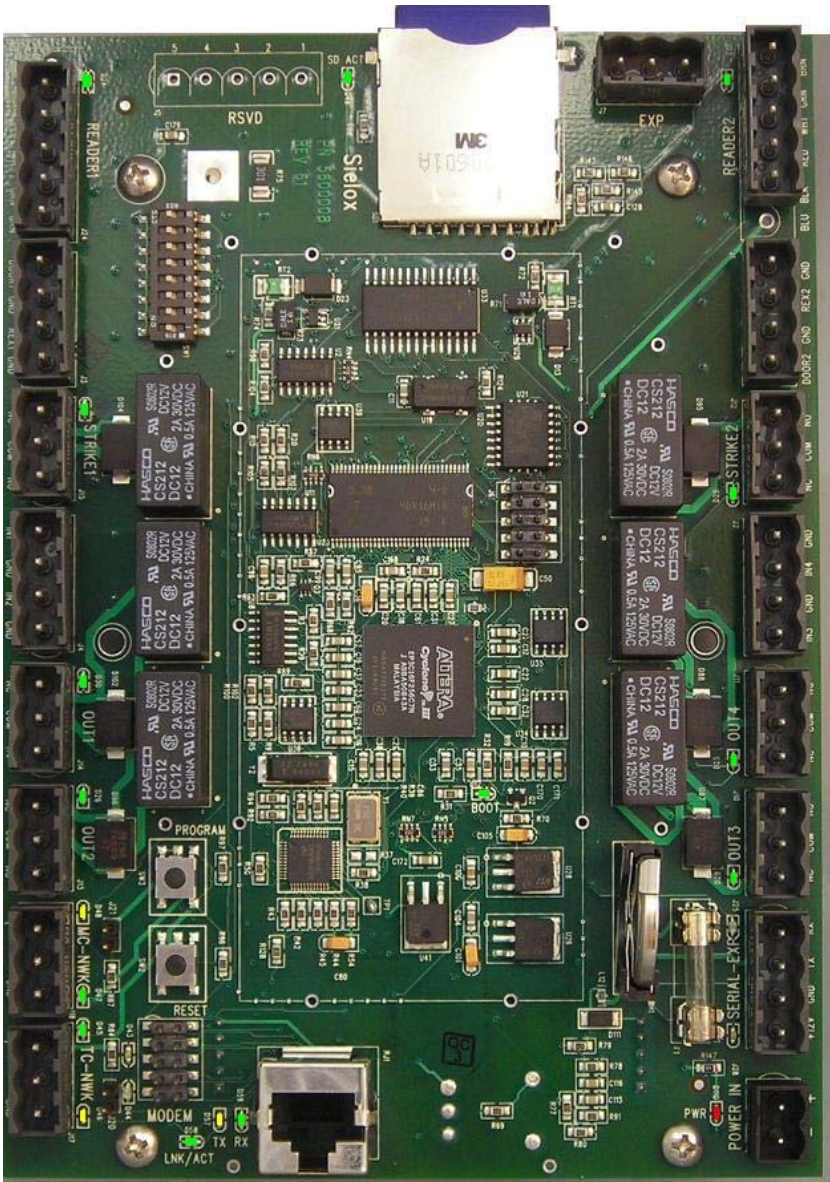


Ethernet / RS-485 with AC-1500 or AC-1200

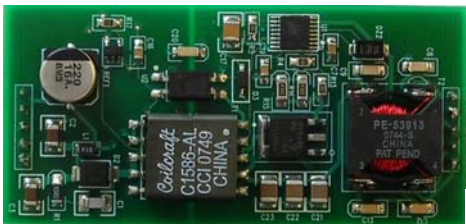
AC-1200, AC-1500 and AC-1700 may be connected as TC's to the AC-1700 Main Controller via the RS-485 Net interface. Other Sielox controllers, such as the AC-300 or AC-600 are not supported. If an unsupported TC is connected, Pinnacle will report a "Legacy TC detected" event.



AC-1700 Board with optional POE Module – Coming soon



AC-1700 Board



AC-POE Module

Connecting the Ethernet Cable

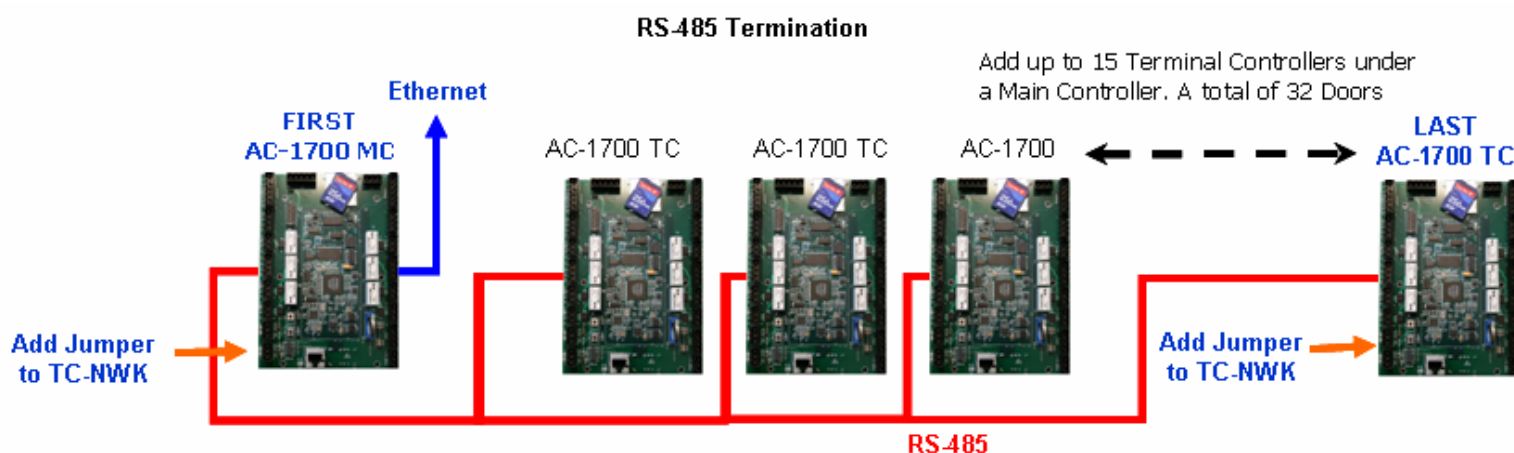
1. Pull the communication cable through the Sielox Enclosure. (See table below)
2. Terminate the CAT5 cable with an RJ-45 connector.
3. Connect the RJ-45 connector to the AC-1700. See the [Ethernet Connector](#) on page 24.

Cable Type	AWG	Wires	Where Used	Color Code	Max. Dist.
Belden 11700A	24	8	Ethernet Communication	Orange/Blue/Green/Brown Striped Orange/Blue/Green/Brown	329 ft.

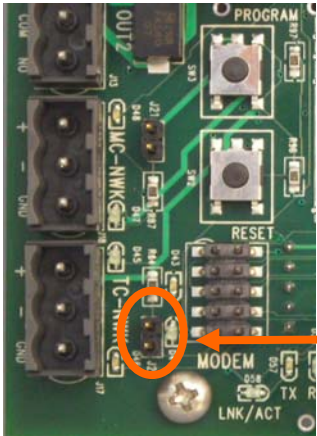
Connecting the RS-485 Cabling

4. Pull the communication cable through the Sielox Enclosure. (See table below)
5. Insert the stripped conductors into the removable RS-485 NET connector and tighten set screws.
6. Observe the polarity.
7. Insert removable connector on the J17 connector.

Note 1: The AC-1700 requires proper termination of the RS-485 network!



Note 2: If you have a mix of AC-1700 and AC-1200 or AC-1500, and the AC-1200 or AC-1500 is the LAST device on the RS-485, then only the FIRST AC-1700 gets the termination.



The RS-485 termination jumper is located next to the TC-NWK J17. Jumpers should be added to the first controller, normally the Main Controller and to the last controller on the RS 485 BUS. (see note 2 above) The jumpers are provided in the AC-1700 connector kit bag.

Cable Type	AWG	Wires	Where Used	Color Code	Max. Dist.
Belden 8723 (Shielded)	22	4	Communication RS-485	Red/Black/White/Green	4000 ft.

Installing the AC-1700

If you plan to use Power Over Ethernet (POE) plug in the optional POE module to the POE connectors located at the back of the all AC-1700 boards. **Coming soon.**

Note: The POE module is limited to a maximum of 1 Ampere. It is designed to power the AC-1700 board and 2 readers. The AC-1700 draws 400mA.

1. Install the AC-1700 board on the standoffs and secure it with 4 screws included in the board package. (if using the POE module add the spacers provided in the AC-POE packaging)
2. Repeat the procedure to all boards.

Connecting signal cables

Connect signal cables to any reader, door strike, output, input, request-to-exit and door switch. Follow these procedures:

1. Pull signal cables through the Sielox Enclosure. (See table below)
2. When connecting these cables to the AC-1700 reader, input or output modules, form a cable bundle using plastic cable ties (Tie wraps).
3. Arrange conductors so that they split out at the right angles from the bundle. Allow enough slack so that the enclosure door can shut easily without pinching the cable bundle.
4. Strip $\frac{1}{4}$ inch of insulation from each conductor that inserts into a connector block.
5. Insert the stripped conductors into respective removable connectors and tighten set screws. (See modules for connector details)
6. Verify cable connections.
7. Insert removable connectors on the appropriate module fixed connector.

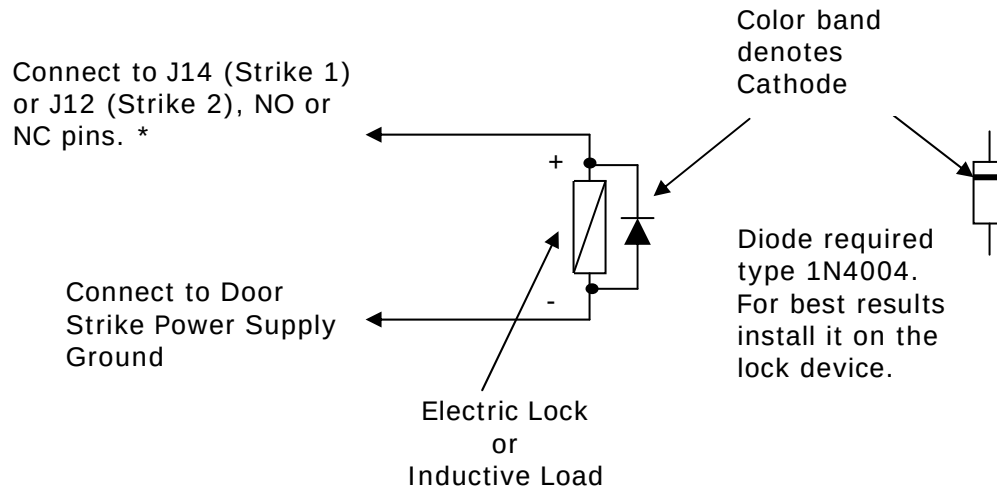
Cable Type	AWG	Wires	Where Used	Color Code	Max. Dist.
Belden 8761 (Shielded)	22	2	Inputs (Door, REX)	Clear / Black	500 ft.
Belden 9460 (Shielded)	18	2	Outputs (Door Lock)	Clear / Black	*
West Penn 3280 (Shielded)	18	5	Wiegand Readers	Red/Black/White/Green/Brown	500 ft.

*Application dependent but typically runs 500 ft.

Note: See the [AC-1700 Connectors](#) on page 24.

Transient Suppressor (Door Locks and Outputs)

The installation of suppression diodes is required for all electric door locks or other inductive loads connected to TC outputs. See diagram below.



***Note1: Use NO when using Maglock. (Fail Safe)**

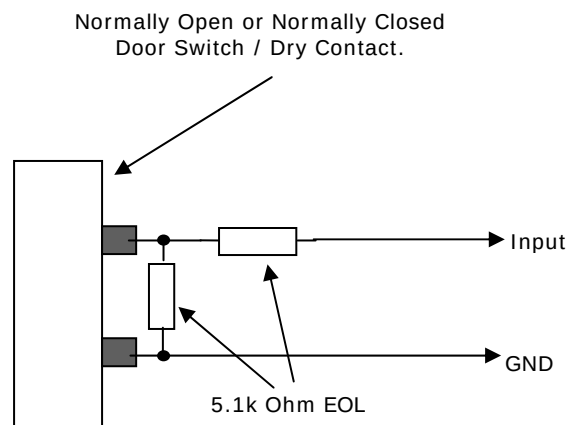
Note2: Use NC when using Electric Strike (Fail Secure)

NO-Normally Open NC-Normally Closed

Supervised Inputs

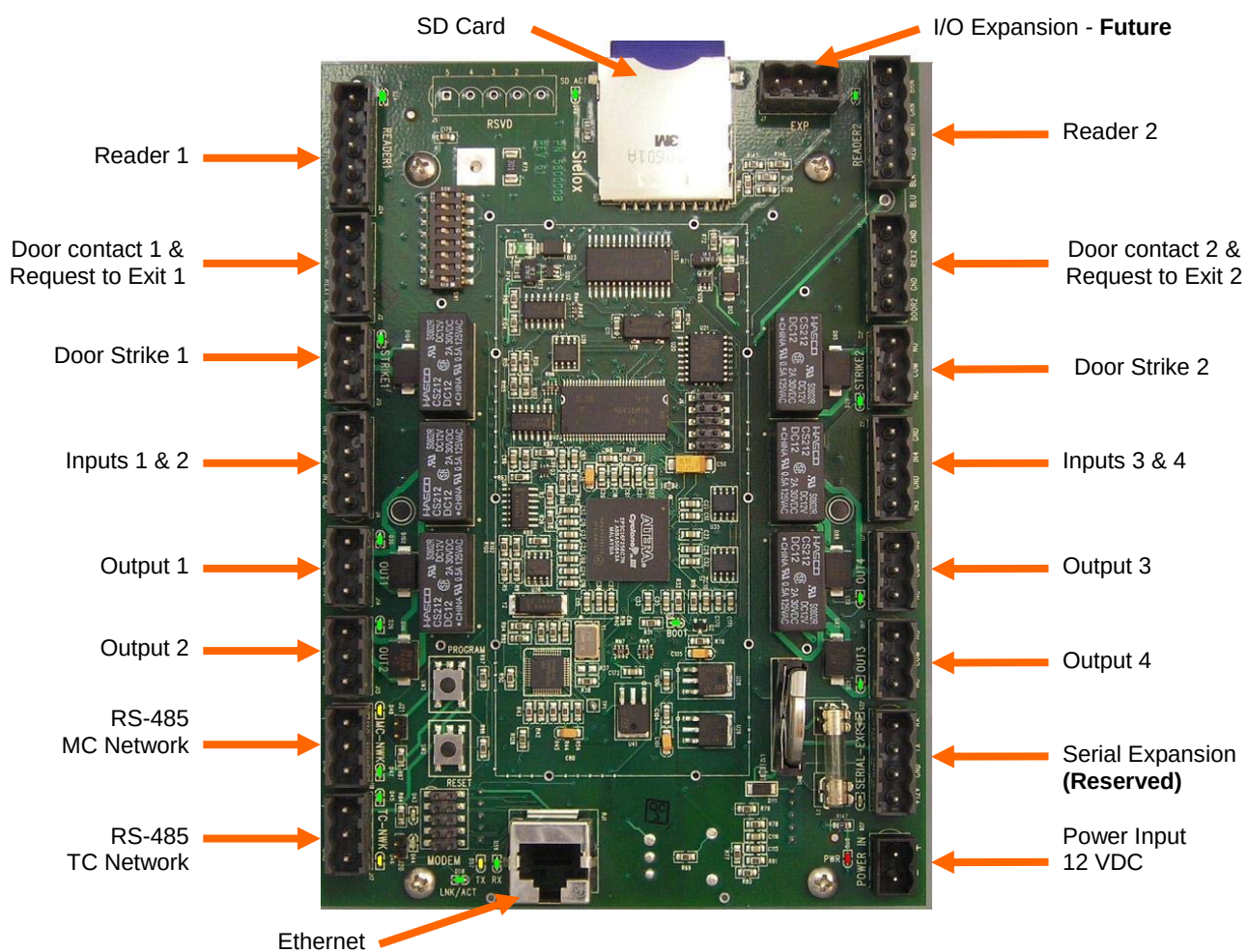
All the AC-1700 inputs can be supervised including the door contacts.

Install two 5.1K Ohm, 5% End-Of-Line resistors as close as possible to the switch. One resistor is connected in parallel with the switch contacts and the other in series with one contact.



Note: Remember to configure the Door Properties or Inputs Properties in Pinnacle Device Setup for the proper switch state and supervision.

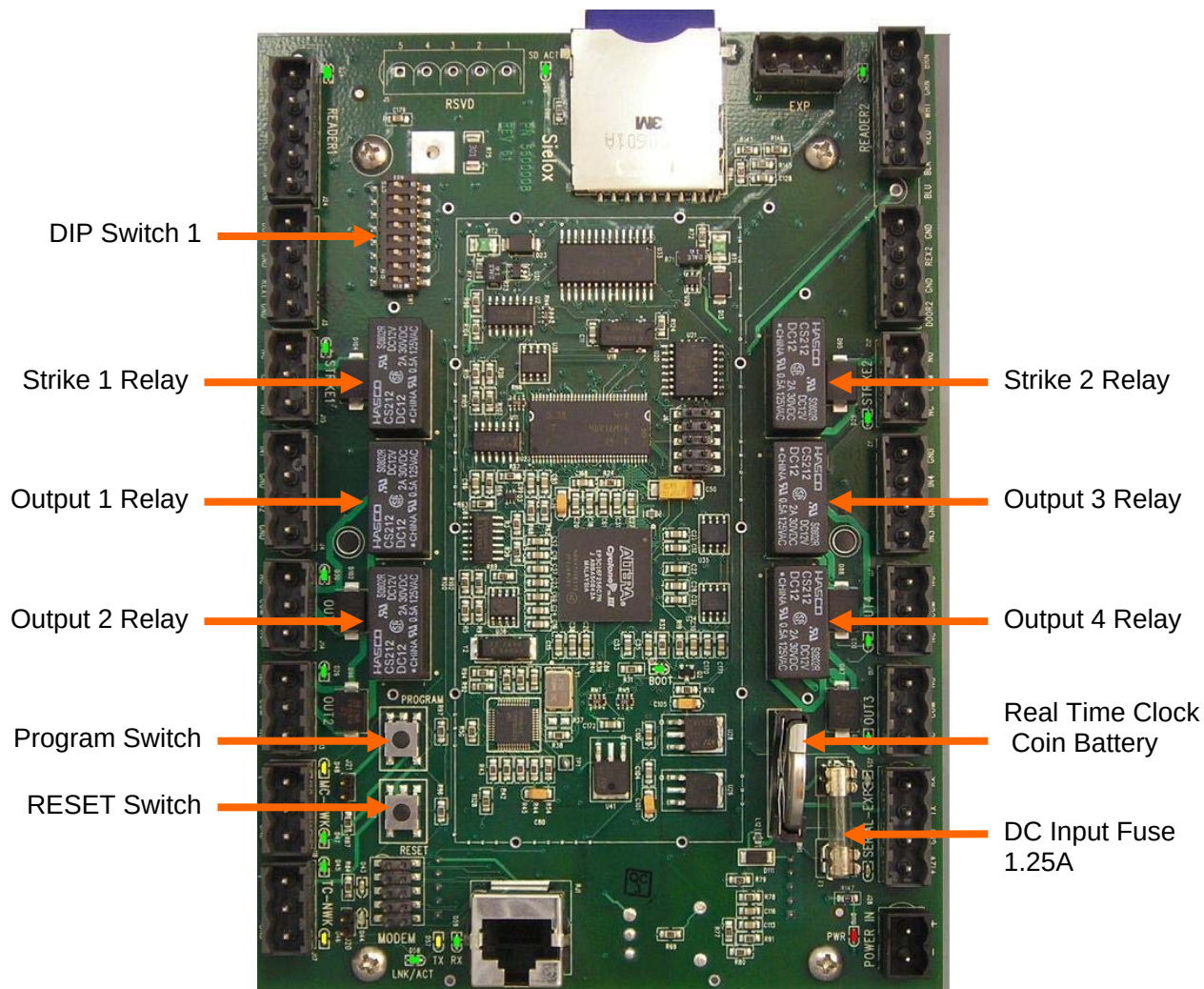
AC-1700 Connectors



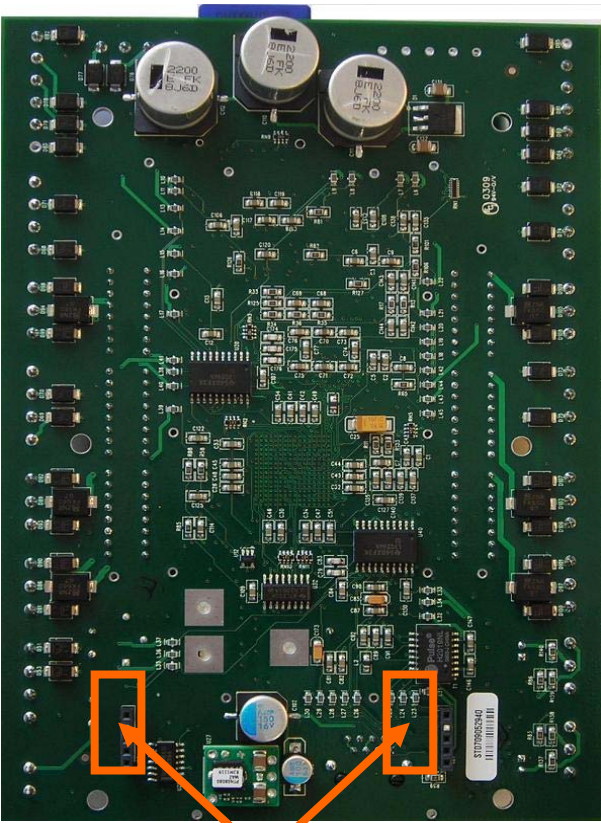
AC-1700 Controller Board
(Actual Size 5"x 7" – 12.7 cm x 17.78 cm)

AC-1700 Connectors

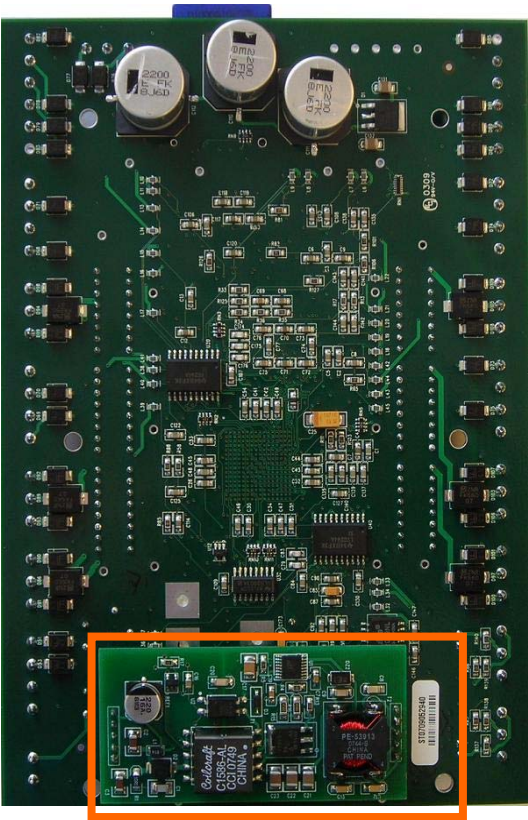
AC-1700 Switches, Relays, Coin Battery and Input Fuse



AC-1700 POE Module Installation



Connectors for AC-POE Module
located on the back of the AC-1700
board



AC-POE Module Installed

AC-1700 Connectors

Readers 1 & 2 – J24 & J23

PIN	Name	Wire Color
BLK	Ground	Black
RED	Power 12 VDC	Red
WHT	Data 1	White
GRN	Data 0	Green
BRN	LED	Brown

Door Contact 1, 2, Request to Exit (REX) 1 & 2 Connectors J3, J1

PIN	Name	Wire Color
DOOR1	Signal	Clear
GND	Ground	Black
REX1	Signal	Clear
GND	Ground	White

Door Strike 1 & 2– J15 and J12

PIN	Name	Wire Color
NC	Normally Closed	Any
COM	Common	Any
NO	Normally Open	Any

Inputs 1, 2, 3 & 4 – J4, and J2

PIN	Name	Wire Color	PIN	Name	Wire Color
IN1	Signal	Black	IN3	Signal	Black
GND	Ground	Clear	GND	Ground	Clear
IN2	Signal	Black	IN4	Signal	Black
GND	Ground	Clear	GND	Ground	Clear

Outputs 1, 2, 3 & 4 – J10, J11, J13 & J14

PIN	Name	Wire Color
NC	Normally Closed	Any
COM	Common	Any
NO	Normally Open	Any

MC-NWK & TC-NWK – J18 & J17 (RS-485 Communication)

PIN	Name	Wire Color
+	TX/RX +	Red
-	TX/RX -	Black
GND	Green	Green

Power IN – J28

PIN	Name	Wire Color
+	+ 12 VDC	Red
-	GND	Black

I/O Expansion (I2C) – J7



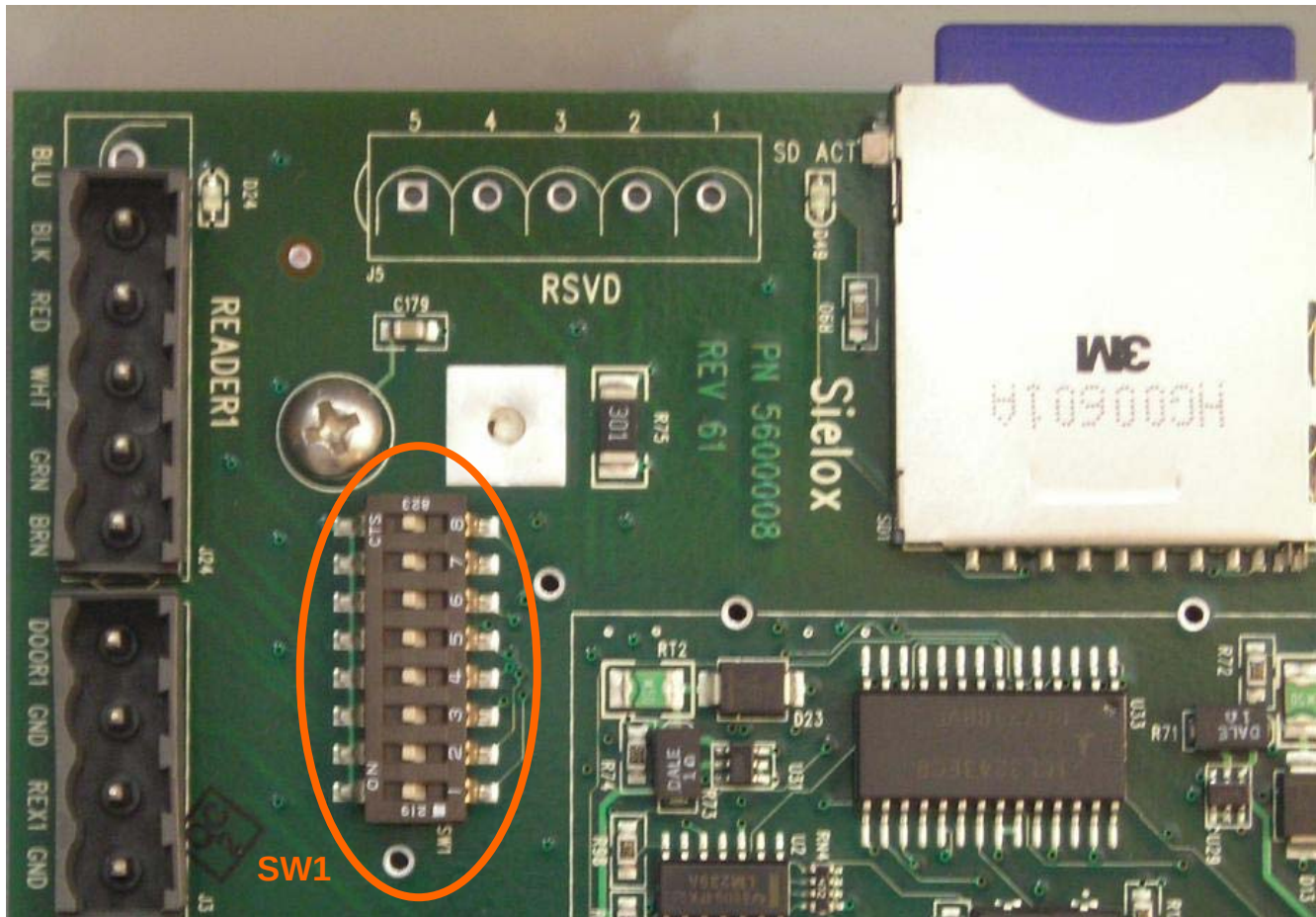
PIN	Name	Wire Color
C	Clock	Black
	GND	Green
D	Data	Red

Setting the Main Controller IP Address

In order to have Pinnacle communicate to the AC-1700 Main Controller or have access to the Web Maintenance Port you have to configure its IP Address, Subnet Mask and Gateway. Please see the [Web Maintenance Port](#) on page 36.

Setting the Controller Dip Switch SW1

Each Main Controller (MC) or Terminal Controller (TC) needs a unique address, by setting the dip switch SW1 located on the upper left corner of the AC-1700 board.

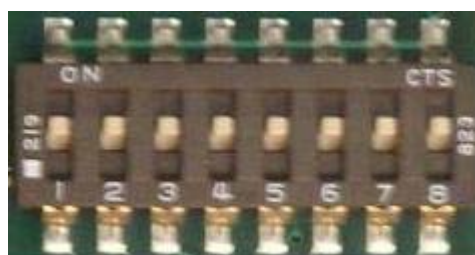


Notes: The on-board TC is always TC address 1, the address of the first external TC has to be 2 or higher.

You can have up to 256 TC's. That is a total of 512 readers per hardware server.

Switch in ON Position →

Switch in OFF Position →



Controller Type

Switch 8 sets the controller type: **OFF** = Main Controller **ON** = Terminal Controller

Controller Address

Use the following table to setup Main Controllers or Terminal Controller addresses.

Switches 1-7 Controller Addresses							
Address	1	2	3	4	5	6	7
1	ON	ON	ON	ON	ON	ON	ON
2	OFF	ON	ON	ON	ON	ON	ON
3	ON	OFF	ON	ON	ON	ON	ON
4	OFF	OFF	ON	ON	ON	ON	ON
5	ON	ON	OFF	ON	ON	ON	ON
6	OFF	ON	OFF	ON	ON	ON	ON
7	ON	OFF	OFF	ON	ON	ON	ON
8	OFF	OFF	OFF	ON	ON	ON	ON
9	ON	ON	ON	OFF	ON	ON	ON
10	OFF	ON	ON	OFF	ON	ON	ON
11	ON	OFF	ON	OFF	ON	ON	ON
12	OFF	OFF	ON	OFF	ON	ON	ON
13	ON	ON	OFF	OFF	ON	ON	ON
14	OFF	ON	OFF	OFF	ON	ON	ON
15	ON	OFF	OFF	OFF	ON	ON	ON
16	OFF	OFF	OFF	OFF	ON	ON	ON
17	ON	ON	ON	ON	OFF	ON	ON
18	OFF	ON	ON	ON	OFF	ON	ON
19	ON	OFF	ON	ON	OFF	ON	ON
20	OFF	OFF	ON	ON	OFF	ON	ON
21	ON	ON	OFF	ON	OFF	ON	ON
22	OFF	ON	OFF	ON	OFF	ON	ON
23	ON	OFF	OFF	ON	OFF	ON	ON
24	OFF	OFF	OFF	ON	OFF	ON	ON
25	ON	ON	ON	OFF	OFF	ON	ON
26	OFF	ON	ON	OFF	OFF	ON	ON
27	ON	OFF	ON	OFF	OFF	ON	ON
28	OFF	OFF	ON	OFF	OFF	ON	ON
29	ON	ON	OFF	OFF	OFF	ON	ON
30	OFF	ON	OFF	OFF	OFF	ON	ON
31	ON	OFF	OFF	OFF	OFF	ON	ON
32	OFF	OFF	OFF	OFF	OFF	ON	ON
33	ON	ON	ON	ON	ON	OFF	ON
34	OFF	ON	ON	ON	ON	OFF	ON
35	ON	OFF	ON	ON	ON	OFF	ON
36	OFF	OFF	ON	ON	ON	OFF	ON
37	ON	ON	OFF	ON	ON	OFF	ON
38	OFF	ON	OFF	ON	ON	OFF	ON

Switches 1-7 Controller Addresses							
Address	1	2	3	4	5	6	7
39	ON	OFF	OFF	ON	ON	OFF	ON
40	OFF	OFF	OFF	ON	ON	OFF	ON
41	ON	ON	ON	OFF	ON	OFF	ON
42	OFF	ON	ON	OFF	ON	OFF	ON
43	ON	OFF	ON	OFF	ON	OFF	ON
44	OFF	OFF	ON	OFF	ON	OFF	ON
45	ON	ON	OFF	OFF	ON	OFF	ON
46	OFF	ON	OFF	OFF	ON	OFF	ON
47	ON	OFF	OFF	OFF	ON	OFF	ON
48	OFF	OFF	OFF	OFF	ON	OFF	ON
49	ON	ON	ON	ON	OFF	OFF	ON
50	OFF	ON	ON	ON	OFF	OFF	ON
51	ON	OFF	ON	ON	OFF	OFF	ON
52	OFF	OFF	ON	ON	OFF	OFF	ON
53	ON	ON	OFF	ON	OFF	OFF	ON
54	OFF	ON	OFF	ON	OFF	OFF	ON
55	ON	OFF	OFF	ON	OFF	OFF	ON
56	OFF	OFF	OFF	ON	OFF	OFF	ON
57	ON	ON	ON	OFF	OFF	OFF	ON
58	OFF	ON	ON	OFF	OFF	OFF	ON
59	ON	OFF	ON	OFF	OFF	OFF	ON
60	OFF	OFF	ON	OFF	OFF	OFF	ON
61	ON	ON	OFF	OFF	OFF	OFF	ON
62	OFF	ON	OFF	OFF	OFF	OFF	ON
63	ON	OFF	OFF	OFF	OFF	OFF	ON
64	OFF	OFF	OFF	OFF	OFF	OFF	ON
65	ON	ON	ON	ON	ON	ON	OFF
66	OFF	ON	ON	ON	ON	ON	OFF
67	ON	OFF	ON	ON	ON	ON	OFF
68	OFF	OFF	ON	ON	ON	ON	OFF
69	ON	ON	OFF	ON	ON	ON	OFF
70	OFF	ON	OFF	ON	ON	ON	OFF
71	ON	OFF	OFF	ON	ON	ON	OFF
72	OFF	OFF	OFF	ON	ON	ON	OFF
73	ON	ON	ON	OFF	ON	ON	OFF
74	OFF	ON	ON	OFF	ON	ON	OFF
75	ON	OFF	ON	OFF	ON	ON	OFF
76	OFF	OFF	ON	OFF	ON	ON	OFF
77	ON	ON	OFF	OFF	ON	ON	OFF
78	OFF	ON	OFF	OFF	ON	ON	OFF
79	ON	OFF	OFF	OFF	ON	ON	OFF
80	OFF	OFF	OFF	OFF	ON	ON	OFF
81	ON	ON	ON	ON	OFF	ON	OFF
82	OFF	ON	ON	ON	OFF	ON	OFF
83	ON	OFF	ON	ON	OFF	ON	OFF
84	OFF	OFF	ON	ON	OFF	ON	OFF
85	ON	ON	OFF	ON	OFF	ON	OFF
86	OFF	ON	OFF	ON	OFF	ON	OFF
87	ON	OFF	OFF	ON	OFF	ON	OFF
88	OFF	OFF	OFF	ON	OFF	ON	OFF
89	ON	ON	ON	OFF	OFF	ON	OFF
90	OFF	ON	ON	OFF	OFF	ON	OFF
91	ON	OFF	ON	OFF	OFF	ON	OFF

Switches 1-7 Controller Addresses							
Address	1	2	3	4	5	6	7
92	OFF	OFF	ON	OFF	OFF	ON	OFF
93	ON	ON	OFF	OFF	OFF	ON	OFF
94	OFF	ON	OFF	OFF	OFF	ON	OFF
95	ON	OFF	OFF	OFF	OFF	ON	OFF
96	OFF	OFF	OFF	OFF	OFF	ON	OFF
97	ON	ON	ON	ON	ON	OFF	OFF
98	OFF	ON	ON	ON	ON	OFF	OFF
99	ON	OFF	ON	ON	ON	OFF	OFF
100	OFF	OFF	ON	ON	ON	OFF	OFF
101	ON	ON	OFF	ON	ON	OFF	OFF
102	OFF	ON	OFF	ON	ON	OFF	OFF
103	ON	OFF	OFF	ON	ON	OFF	OFF
104	OFF	OFF	OFF	ON	ON	OFF	OFF
105	ON	ON	ON	OFF	ON	OFF	OFF
106	OFF	ON	ON	OFF	ON	OFF	OFF
107	ON	OFF	ON	OFF	ON	OFF	OFF
108	OFF	OFF	ON	OFF	ON	OFF	OFF
109	ON	ON	OFF	OFF	ON	OFF	OFF
110	OFF	ON	OFF	OFF	ON	OFF	OFF
111	ON	OFF	OFF	OFF	ON	OFF	OFF
112	OFF	OFF	OFF	OFF	ON	OFF	OFF
113	ON	ON	ON	ON	OFF	OFF	OFF
114	OFF	ON	ON	ON	OFF	OFF	OFF
115	ON	OFF	ON	ON	OFF	OFF	OFF
116	OFF	OFF	ON	ON	OFF	OFF	OFF
117	ON	ON	OFF	ON	OFF	OFF	OFF
118	OFF	ON	OFF	ON	OFF	OFF	OFF
119	ON	OFF	OFF	ON	OFF	OFF	OFF
120	OFF	OFF	OFF	ON	OFF	OFF	OFF
121	ON	ON	ON	OFF	OFF	OFF	OFF
122	OFF	ON	ON	OFF	OFF	OFF	OFF
123	ON	OFF	ON	OFF	OFF	OFF	OFF
124	OFF	OFF	ON	OFF	OFF	OFF	OFF
125	ON	ON	OFF	OFF	OFF	OFF	OFF
126	OFF	ON	OFF	OFF	OFF	OFF	OFF
127	ON	OFF	OFF	OFF	OFF	OFF	OFF
128	OFF	OFF	OFF	OFF	OFF	OFF	OFF

AC-1700 Status LED

LED	Description
Power Indicator	
PWR	ON = 12 Volts present. OFF=No Power ¹
CPU Status	
BOOT	ON =CPU Running. OFF=CPU Boot Failed ²
SD Card	
SD ACT	ON = Reading or Writing data to the SD Card ³
Ethernet	
LNK/ACT	ON = Connected BLINKING = Receiving/Transmitting Data ⁴
RX	ON= AC-1700 Receiving Data ⁴
TX	ON= AC-1700 Transmitting Data ⁴
MC-NWK or TC-NWK	
GREEN LED	ON= Receiving Data ⁵
RED LED	ON= Transmitting Data ⁵
STRIKE 1 and 2	
GREEN LED	ON = Output on. OFF = Output off ⁶
OUT 1, 2, 3 and 4	
GREEN LED	ON = Output on. OFF = Output off ⁶

¹ This LED is located next to the POWER IN connector

² This LED is located under the AC-1700 shield.

³ This LED is located next to the SD Card.

⁴ These LED's are located next to the RS-485 connectors.

⁵ These LED's are located next to the respective strike relay connector.

⁶ These LED's are located next to the respective output relay connector.

Real Time Clock Backup Battery

The AC-1700 has a Lithium battery which holds the TC Real Time Clock in the event of AC power loss. This battery needs to be checked on an annual basis by the field technician with a voltmeter, during preventive maintenance.

Follow these procedures to check the battery voltage and replace it if needed:

1. Turn off the main power of the backplane by removing the POWER-IN connector.
2. With a digital voltmeter, measure the battery voltage on board. (Do not remove the battery from the socket)
3. The voltage should be between 2.7 to 3 volts.
4. Replace the battery if below 2.7 volts.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries in accordance with the manufacturer instructions.

Battery type: Lithium Battery PANASONIC BR2032.

Power Cables

To connect the power cables to the AC-1700 POWER IN connector J28:

1. Pull power cable through the Sielox Enclosure. (See table below)
2. Insert the stripped conductors into the removable POWER IN connector and tighten set screws.
3. Observe the polarity.
4. Insert removable connector on the POWER IN connector.

Cable Type	AWG	Wires	Where Used	Color Code	Max. Dist.
Belden 1307A	16	2	Power / Battery	Red/Black	50 ft.

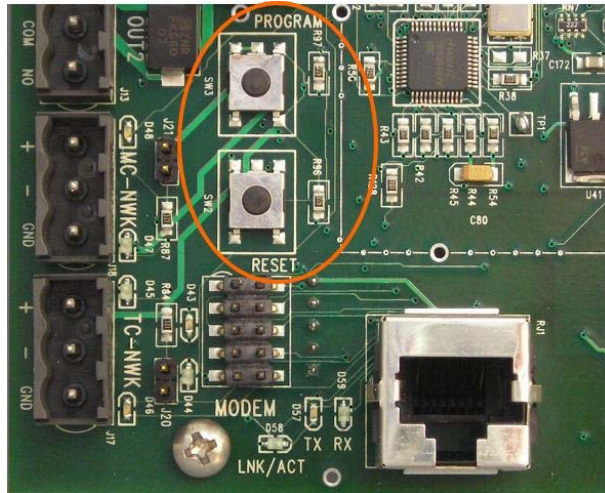
AC Power Surge Suppressor

Sielox highly recommends the use of an AC power surge suppressor such as Ditek-1F. For more information go to <http://www.ditekcorp.com/product-details.asp?ProdKey=11>

AC-1700 Push Buttons

There are 2 push buttons on the AC-1700 board, PROGRAM and RESET.

They are located on the lower left corner of the AC-1700 board, above the Ethernet connector.



RESET

Press and hold this button for 3 seconds, the Ethernet TX, Ethernet RX, and SD ACT LED's all come on for about one second and then the AC-1700 reboots itself. Release the RESET button when the LED's turn. The database files on the SD card and network settings are not affected.

PROGRAM

Press and hold this button for 3 seconds, the Ethernet TX, Ethernet RX, and SD ACT LED's all come on for about one second and then the controller reprograms its Flash memory from the SD Card. As the controller reprograms and then verifies the Flash memory, the SD ACT, Ethernet TX LED, and Ethernet TX LED all flash once a second indicating that reprogramming and verification are in progress. Once the reprogramming and verification are complete, the controller reboots itself. If no files are found in the SD card, the process is aborted.

Warning: Do not remove power until this process is completed!

Note: On board flash upgrade requires that you load the latest firmware onto the SD card.

RESET and PROGRAM

Press and hold both 'Reset' and 'Program' buttons for 3 seconds, the Ethernet TX, Ethernet RX, and SD ACT LED's all come on for about one second and this will cause the AC 1700 to restore the factory defaults including database files and network setting restoring IP address to 192.168.1.170 and reboot itself.

Web Maintenance Port

The Web Maintenance Port requires a computer with a browser installed, and an Ethernet port. For best results use the Microsoft Internet Explorer 7 or later.

You can connect straight from the computer to the AC-1700 Ethernet connector or through the network.

Note: To perform this setting you must have basic knowledge of networking, static and dynamic IP and TCP/IP. If you don't have this knowledge, you will need to get the network administrator to help you. This will save you time getting the AC-1700 configured properly.

Make sure you know which IP addresses are available in your network, by asking the network administrator, to avoid conflict with other devices already connected to the network.

The AC-1700 comes from the factory with the following default network settings:

IP: 192.168.1.170

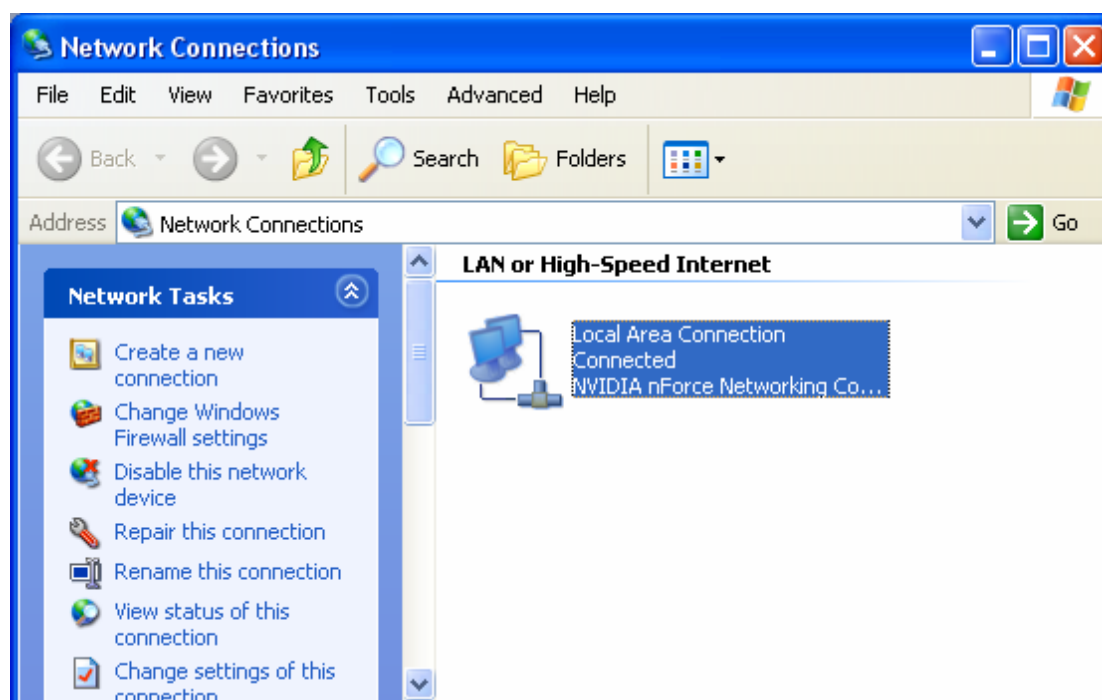
Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

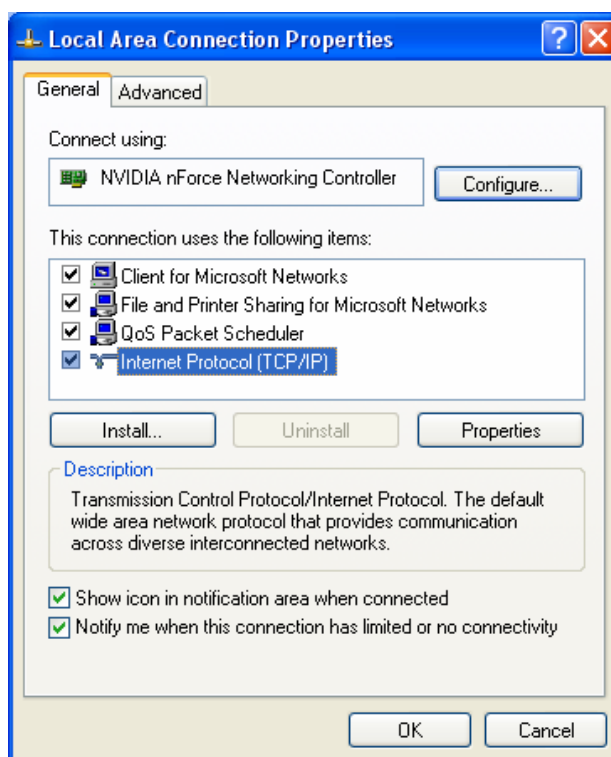
Changing the AC-1700 default Network Settings

To configure the AC-1700 to use a different IP address, you must first set your computer to be in the same IP class as the AC-1700 default IP address. To do that follow steps:

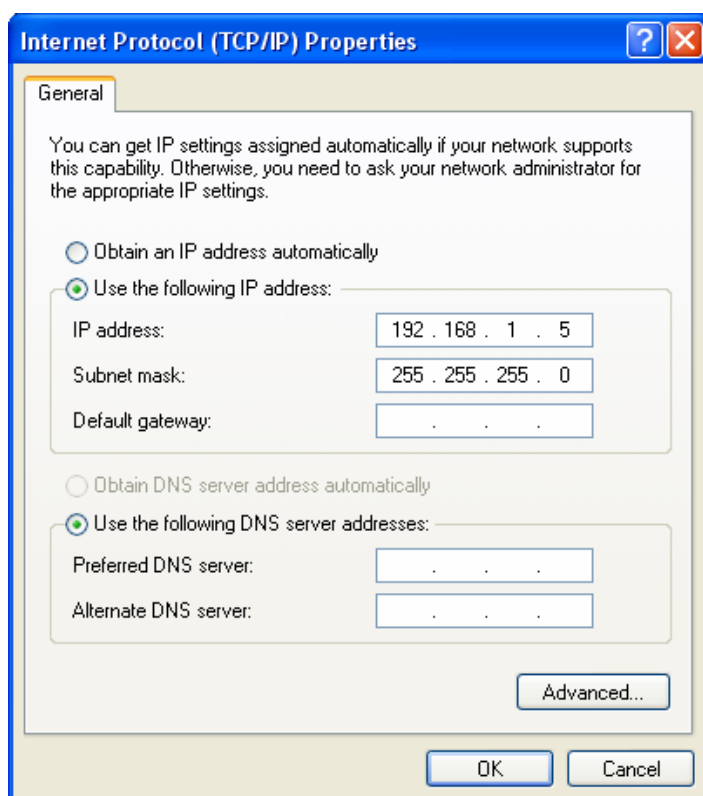
1. Open the network connection on you computer, right click on the Local Area Connection and select properties.



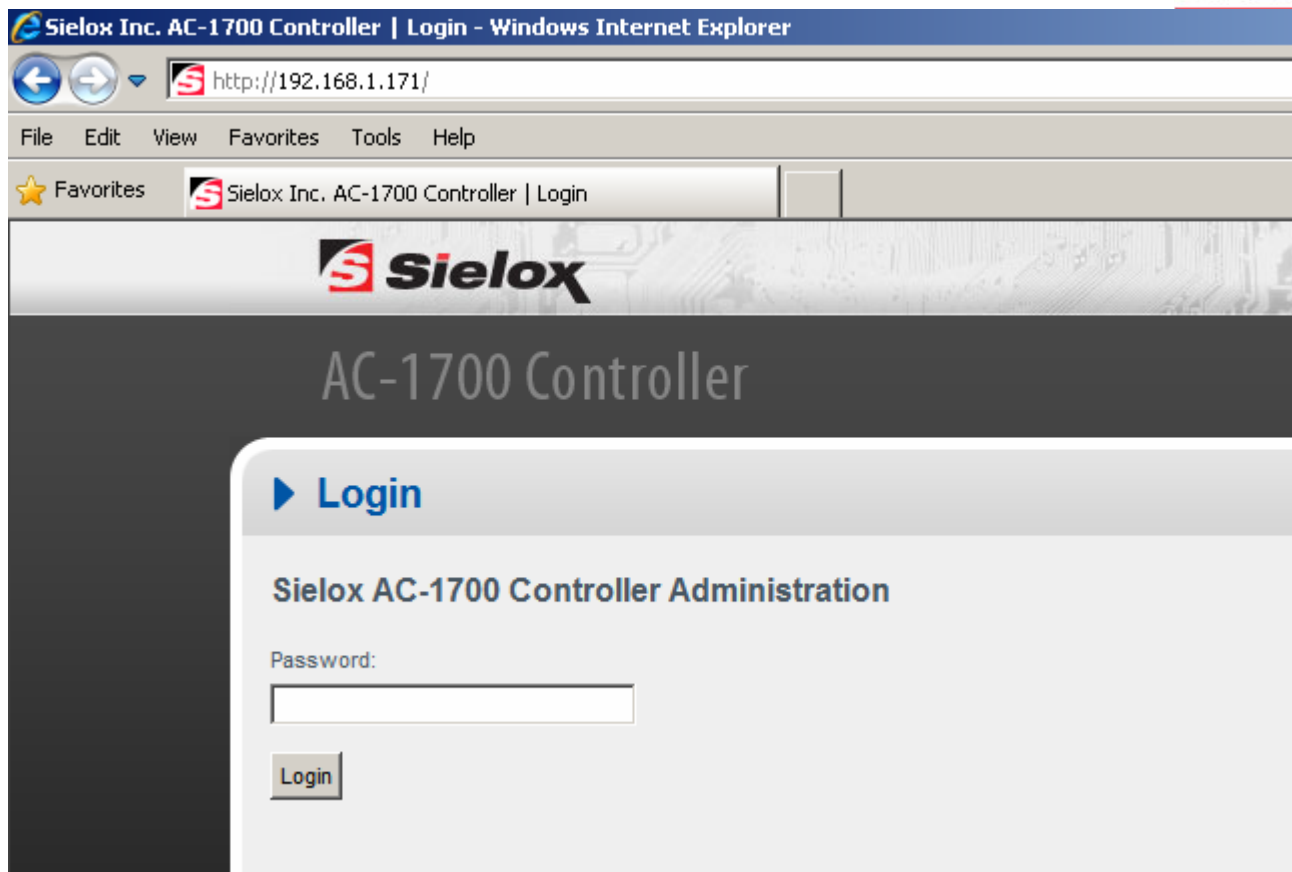
2. Select the Internet Protocol(TCP/IP) item and click on the Properties button.



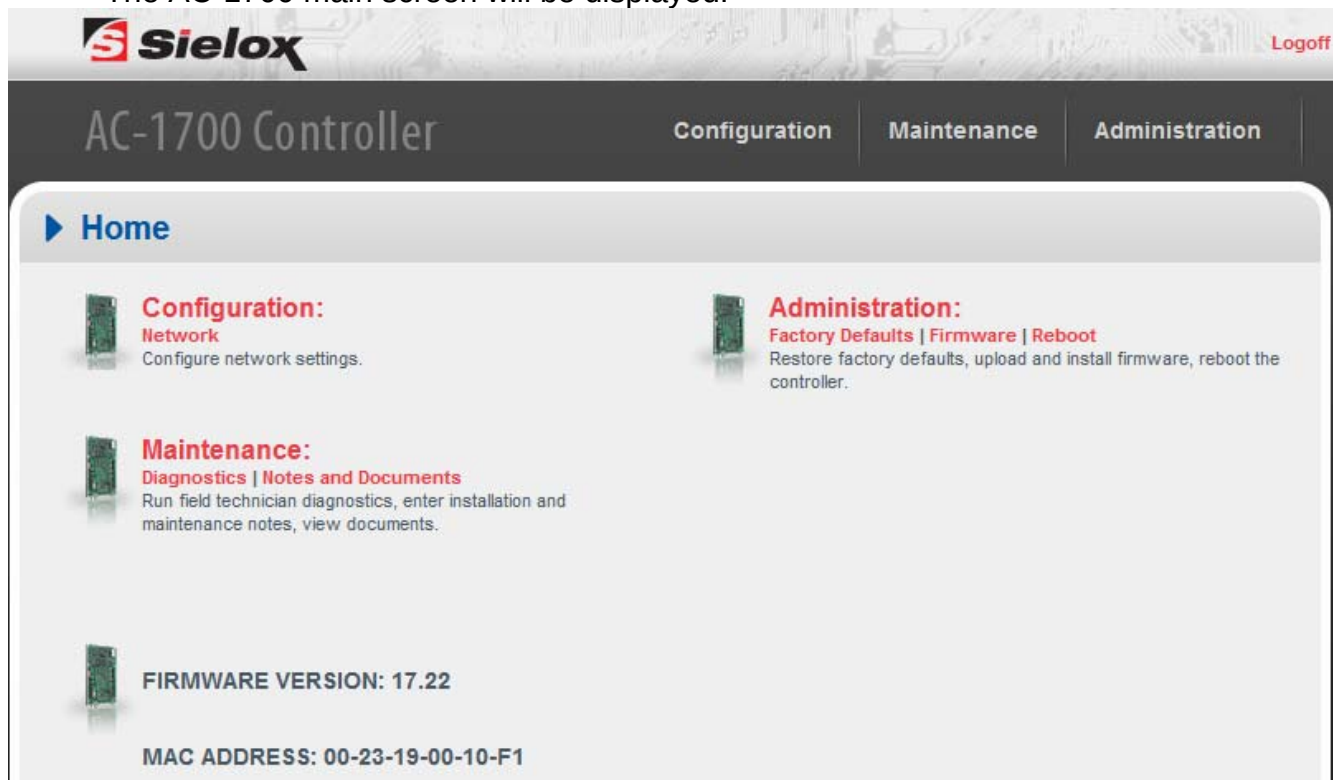
3. Make a note of the IP Address if your computer uses static IP, you will need it later.
4. Select the "Use the following IP Address:" and type the information shown below.



5. Click Ok button and then the close button on the Local Area Connection Properties window.
6. Make sure the AC-1700 is powered and connected to the network or to your computer.
7. Open the Web browser and type in the address bar: `http://192.168.1.170` then hit the "Enter" key. The AC-1700 login page will be displayed.



8. On the password field type “admin” then click on the login button or hit the “Enter” key. The AC-1700 main screen will be displayed.



9. Select “Network” under configuration.

The screenshot shows the Sielox AC-1700 Controller web interface. The top navigation bar includes the Sielox logo, a 'Logoff' link, and tabs for 'Configuration', 'Maintenance', and 'Administration'. The 'Configuration' tab is active, and the 'Network' sub-tab is selected. On the left, a sidebar lists 'Network', 'System', 'User Information', and 'COM'. The main content area displays the 'Network' configuration page with the following fields:

- MAC Address: 00-23-19-00-10-F1
- IP Address: 192 . 168 . 1 . 171
- Subnet Mask: 255 . 255 . 255 . 0
- Default Gateway: 192 . 168 . 1 . 1

A 'Save Network Settings' button is located at the bottom of the configuration area.

10. Type the new IP address and then click the “Save Network Settings” button. The following screen will be displayed.

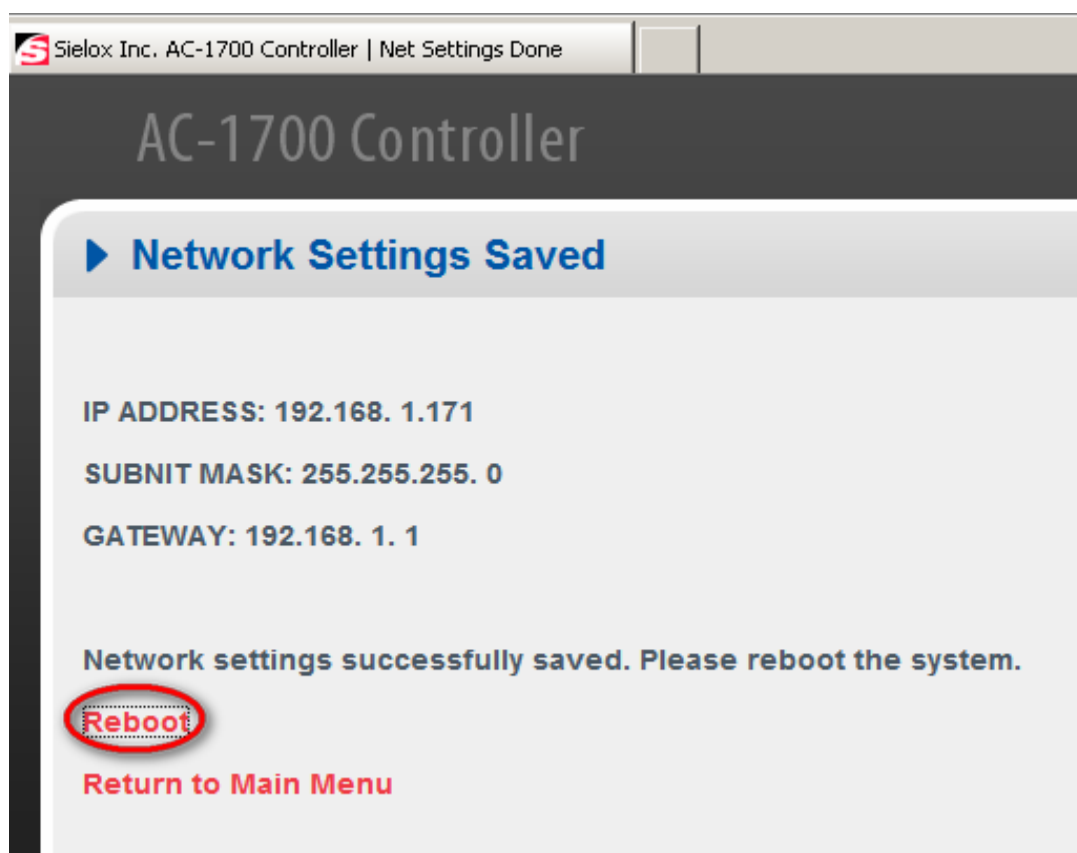
The screenshot shows the Sielox AC-1700 Controller web interface after saving network settings. The top navigation bar includes the Sielox logo, a 'Logoff' link, and tabs for 'Configuration', 'Maintenance', and 'Administration'. The 'Configuration' tab is active, and the 'Network' sub-tab is selected. The main content area displays the 'Network Settings Saved' confirmation screen with the following information:

- IP ADDRESS: 192.168. 1.171
- SUBNIT MASK: 255.255.255. 0
- GATEWAY: 192.168. 1. 1

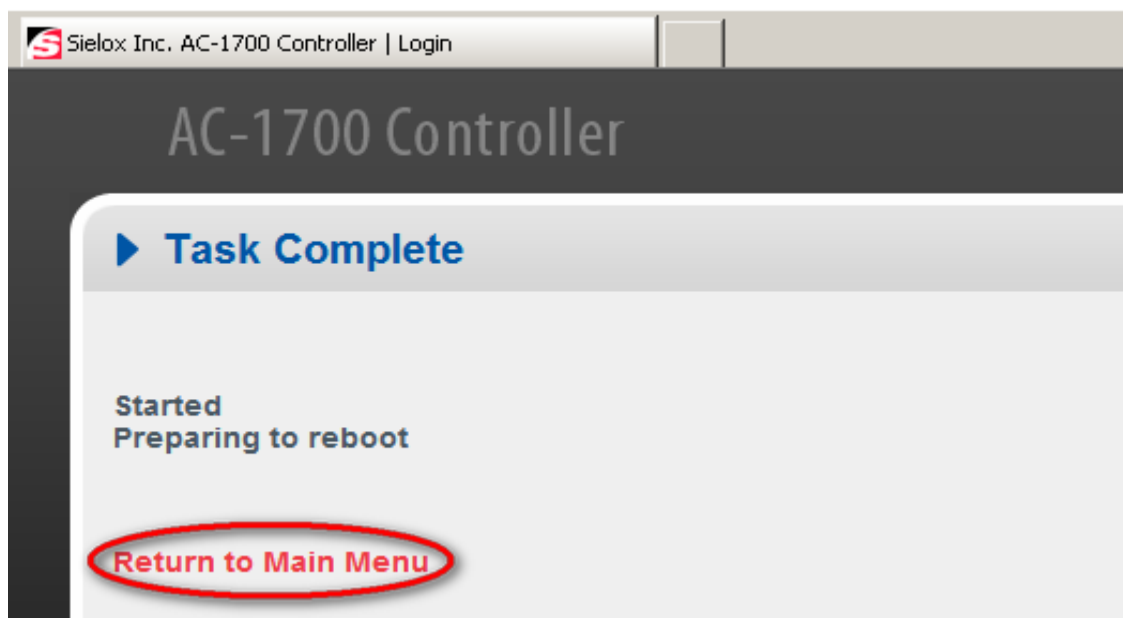
Below the configuration details, a message states: "Network settings successfully saved. Please reboot the system." Two links are provided: 'Reboot' and 'Return to Main Menu'.

Note: See [Network Defaults](#) on page 36.

11. In order for the new IP to take effect you have to reboot the AC-1700. “Click on the Reboot link”



12. Click on 'Return to the Main Menu'. You will be asked to login again.



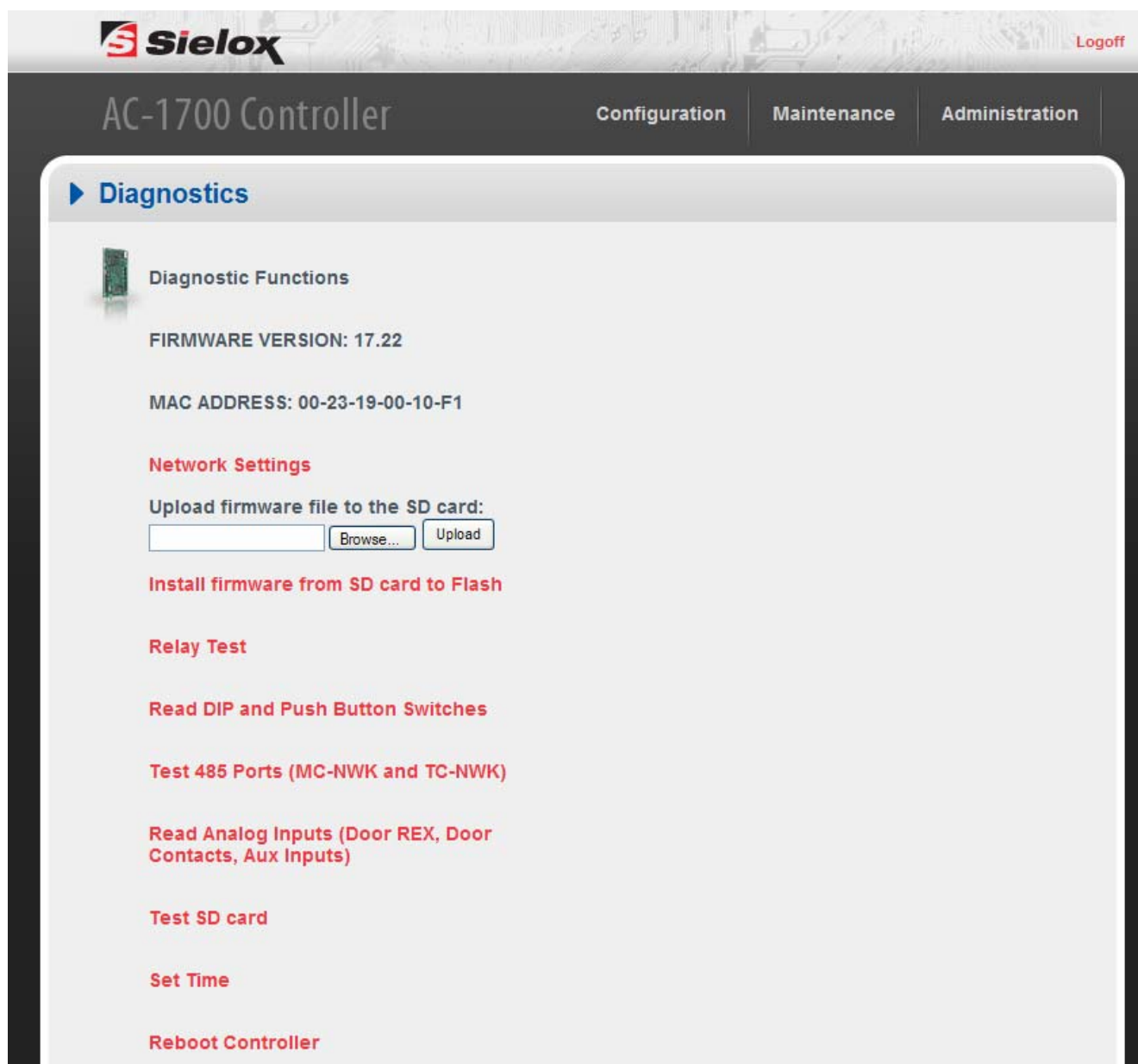
Note: If you change the IP address of the AC-1700, you may need to change the IP address of your computer into the new IP class, to continue the configuration.

Diagnostics

You can perform the following diagnostics:

- Set Time – Sets the AC-1700 Real Time Clock date and time
- Relay Test – Tests the 6 on board relays (Strike 1 and 2, Out 1, 2, 3 and 4) (Sielox factory only)
- A/D Test (Analog to Digital Conversion) – Tests all 10 analog inputs (Door switch 1 and 2, Rex 1 and 2, Inputs 1, 2, 3 and 4 and Reader 1 and 2 detection inputs)
- Read Switches – Reads the position of dip switch SW1. (Controller type & Addresses)
- Test RS485 serial – Tests both RS-485 ports, it requires a loop back cable.
- Test Modem – Tests the MODEM port, it requires a loop back cable.
- Test Digital I/O – Test I/O modules connected to the I2C connector. (AC-1200/AC1500 BP7)
- Test SD card – Reads, writes and verifies a file to the SD card.
- Reboot Controller – Reboots the AC-1700.

Select “Diagnostics” under the “Maintenance” menu to display the following:



The screenshot displays the web interface of the AC-1700 Controller. At the top, the Sielox logo is on the left, and a 'Logoff' link is on the right. Below the logo, the text 'AC-1700 Controller' is visible. A navigation bar contains three tabs: 'Configuration', 'Maintenance', and 'Administration'. The 'Maintenance' tab is selected, and the 'Diagnostics' sub-menu is active, indicated by a blue arrow and the word 'Diagnostics' in blue. Below this, a small circuit board icon is next to the heading 'Diagnostic Functions'. The interface lists several diagnostic options: 'FIRMWARE VERSION: 17.22', 'MAC ADDRESS: 00-23-19-00-10-F1', 'Network Settings' (in red), 'Upload firmware file to the SD card:' (with a text input field, 'Browse...' button, and 'Upload' button), 'Install firmware from SD card to Flash' (in red), 'Relay Test' (in red), 'Read DIP and Push Button Switches' (in red), 'Test 485 Ports (MC-NWK and TC-NWK)' (in red), 'Read Analog Inputs (Door REX, Door Contacts, Aux Inputs)' (in red), 'Test SD card' (in red), 'Set Time' (in red), and 'Reboot Controller' (in red).

Set Time

1. Select the “Diagnostic” under the “Maintenance option” on the AC-1700 main Web page.
2. Select “Set Time”, the following screen will be displayed

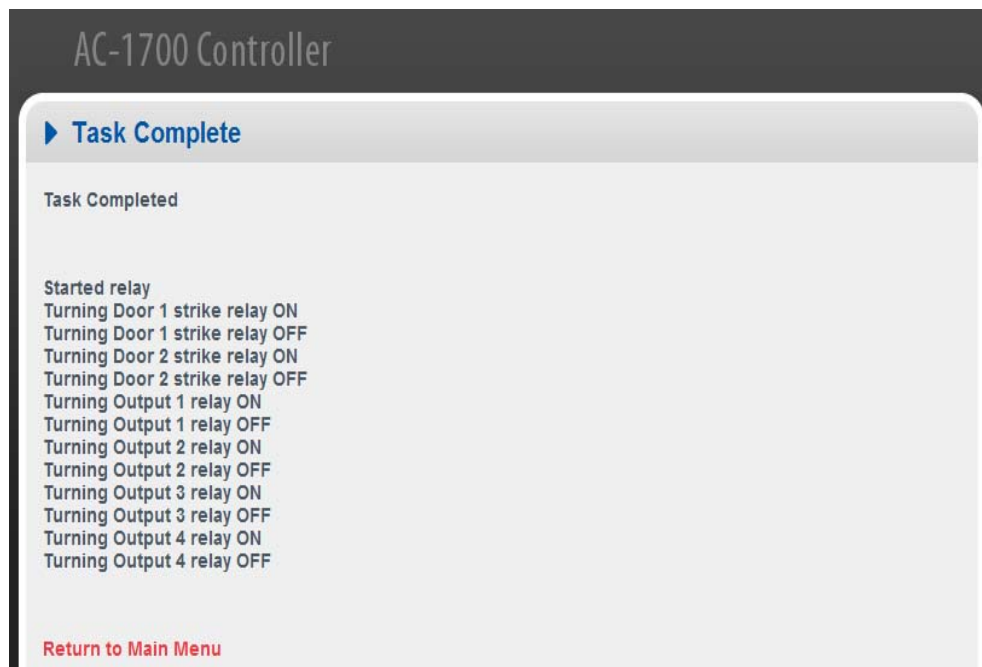


The screenshot shows the AC-1700 Controller web interface. At the top, there is a header with the Sielox logo and a 'Logoff' link. Below the header, there is a navigation bar with three tabs: 'Configuration', 'Maintenance', and 'Administration'. The 'Maintenance' tab is selected. The main content area is titled 'Time' and contains two sections: 'Date' and 'Time'. The 'Date' section has three input fields: 'Month (1-12)' with the value '6', 'Day (1-31)' with the value '4', and 'Year (yyyy)' with the value '2009'. The 'Time' section has three input fields: 'Hours (0-23)' with the value '14', 'Minutes (0-59)' with the value '10', and 'Seconds (0-59)' with the value '6'. Below these fields is a button labeled 'Set Date/Time'.

3. Enter the Date and Time then press “Set Date/Time” button.
4. Press “Main Menu”.

Relay Test – This is strictly a continuity test. (Ohm Meter Required)

1. Select the “Diagnostic” under the “Maintenance option” on the AC-1700 main Web page.
2. Select “Relay Test”, the following screen will be displayed, each Relay will turn on and then off. Also the LED close to the relay will turn on and then off.



3. Press Return to Main Menu.

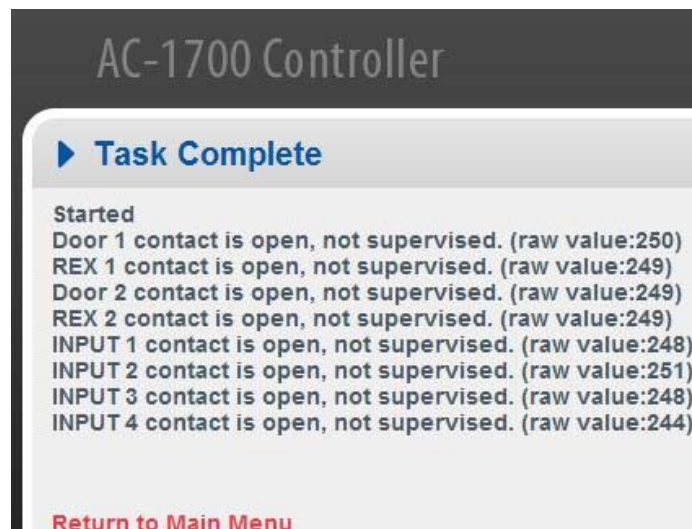
A/D Test

This test reads 10 inputs and displays the values on the screen. In order to perform this test you need switches connected to the following inputs: IN1, IN2, IN3, IN4, DOOR1, REX1, DOOR2 and REX2.

You need 2 card readers, one connected to READER1 and the other to READER2.

The inputs can have end of line resistors for testing supervision or just a regular switch for testing open / close. See [Supervised Inputs](#) diagram on page 23.

1. Select the "Diagnostic" under the "Maintenance option" on the AC-1700 main Web page.
2. Select "A/D Test", the following screen will be displayed.

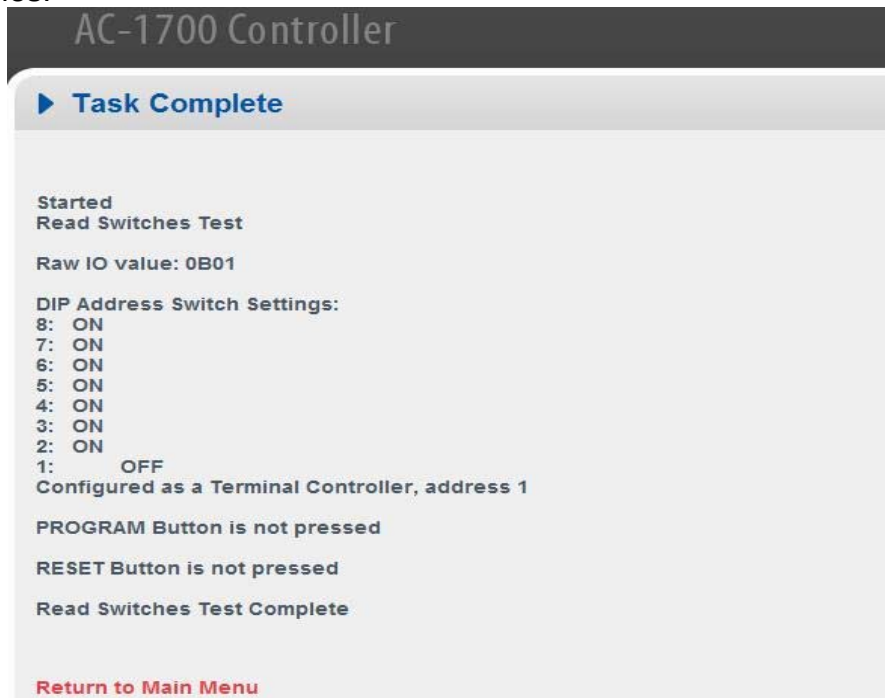


3. Press Return to Main Menu.

Read Switches

This test reads the dip switch SW1. The values range from 300-3FF in hexadecimal. With all the switches in the OFF position the read value is 300, with all the switches in the ON position the read value is 3FF.

1. Select the "Diagnostic" under the "Maintenance option" on the AC-1700 main Web page.
2. Select "read Switches", the following screen will be displayed, with the value read from the switches.



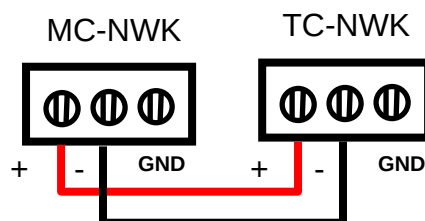
4. Press Return to Main Menu.

Test 485 Serial

In order to perform this test you need a loop back cable.

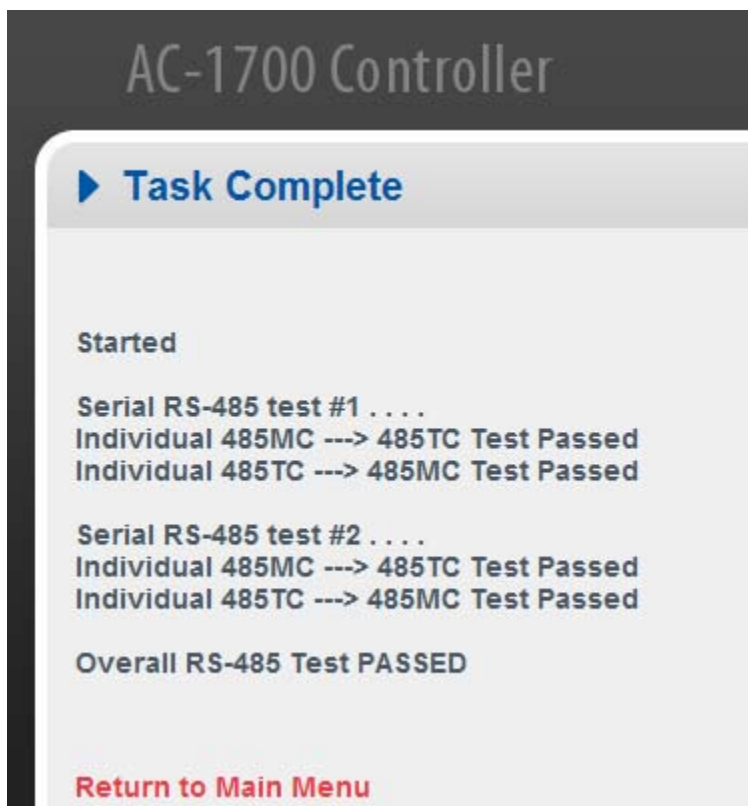
To make a loop back cable you need 2 inches of red wire, 2 inches of black wire and 2 AC-1700 removable connectors from the MC-NWK and TC-NWK.

The red wire is connected from MC-NWK + to TC-NWK +, the black wire is connected from MC-NWK - to TC-NWK -.



1. Connect the loop back cable on the AC-1700 connectors labeled MC-NWK and TC-NWK.

2. Select the "Diagnostic" under the "Maintenance option" on the AC-1700 main Web page.
3. Select "Test 485 Serial", the following screen will be displayed, with the results of the test.



4. Press Return to Main Menu.

Test MODEM and Test Digital I/O are not available at the time of this release.

Test SD Card

1. Select the "Diagnostic" under the "Maintenance option" on the AC-1700 main Web page.
2. Select "Test SD Card", the following screen will be displayed, with the results of the test.



3. Press Return to Main Menu

Upgrading Firmware

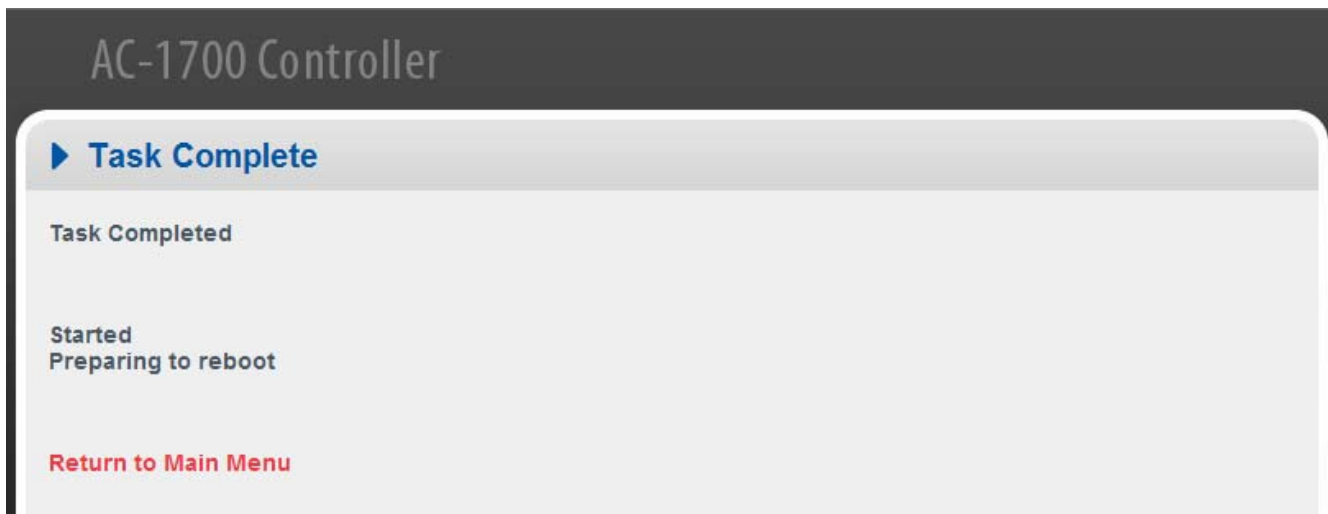
1. Download the latest firmware from the Sielox Web site to your computer. (You may have to contact Sielox Technical Support to obtain the AC-1700 firmware)
2. Open a Web browser and connect to the AC-1700 that you want to upgrade the firmware.
3. On the "Diagnostic Page" click on the browse button under the "Upload firmware file to the SD card:" and select the AC-1700 firmware file that you downloaded from Sielox.
4. Click the Upload button to transfer the file from the computer to the AC-1700 SD card.
5. Click on the "Install firmware from SD card to Flash" to upgrade the AC-1700 firmware, follow the screen prompts.



Note: Wait until the process is finished. Failure to do so may leave the AC-1700 inoperable.

6. Press Return to Main Menu
7. Select the "Diagnostic" under the "Maintenance option" on the AC-1700 main Web page.

8. Select "Reboot Controller".



9. Press Return to Main Menu. The main page should display the new firmware version.

AC-1700 Board Serial Number Format

The serial number consists of eighteen alpha-numeric characters. See section 2.0 for the format to be used when marking the serial number.

EXAMPLE:

712345603P02454001

Serial Number Format

The serial number shall be created using the following format:

